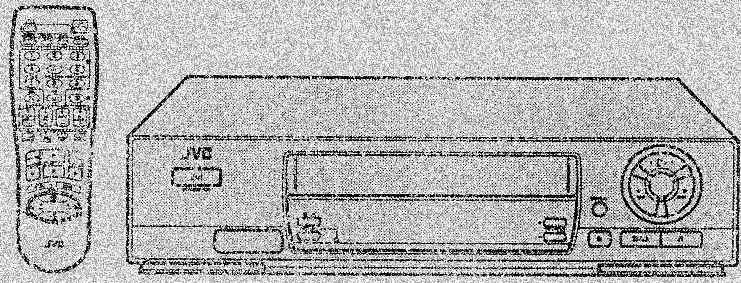
JVC

SERVICE MANUAL

VIDEO CASSETTE RECORDER

HR-J255EK/J255ES



VIDEO Plus+™

VHS
PAL

SPECIFICATIONS

GENERAL

Power requirement	: AC 220 – 240 V∼, 50/60 Hz
Power consumption	
Power on	: 20 W
Power off	: 5 W
Temperature	
Operating	: 5°C to 40°C
Storage	: –20°C to 60°C
Operating position	: Horizontal only
Dimensions (WxHxD)	: 400 x 94 x 277 mm
Weight	: 3.3 kg
Format	: VHS PAL standard
Maximum recording time	
(SP)	: 240 min. with E-240 video cassette
(LP)	: 480 min. with E-240 video cassette

VIDEO/AUDIO

Signal system	: PAL-type colour signal and CCIR monochrome signal, 625 lines/50 fields
Recording system	: Rotary two-head helical scan system (HR-J256/255EK/255ES)
Signal-to-noise ratio	: 45 dB
Horizontal resolution	: 250 lines
Frequency range	: 70 Hz to 10,000 Hz
Input/Output	: 21-pin scart connector x 2 (IN/OUT x 1, IN x 1)

TUNER/TIMER

TV channel storage capacity	: 99 positions (+AUX position)
Tuning system	: Frequency synthesized tuner
Channel coverage	
HR-J255EK	: UHF channels 21 – 69 (470 – 862 MHz)
HR-J255ES	: VHF 44.5 – 143/143 – 470 MHz UHF 470 – 862 MHz
Aerial output	. UHF channels 28 – 60 (Adjustable)
Memory backup time	: Approx. 10 min.

ACCESSORIES

Provided accessories	: RF cable, Infrared remote control unit, "AA" battery x 2

Specifications shown are for SP mode unless otherwise specified.
E.& O.E. Design and specifications subject to change without notice.

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Safety Precautions

1. This design of this product contains special hardware and many circuits and components specially for safety purposes. For continued protection, no changes should be made to the original design unless authorised in writing by the manufacturer. Replacement parts must be identical to those used in the original circuits.
2. Any unauthorised design alterations or additions will void the manufacturer's guarantee ; furthermore the manufacturer cannot accept responsibility for personal injury or property damage resulting therefrom.
3. Essential safety critical components are identified by (⚠) on the Parts List and by shading on the schematics, and must never be replaced by parts other than those listed in the manual. please note however that many electrical and mechanical parts in the product have special safety related characteristics. These characteristics are often not evident from visual inspection. Parts other than specified by the manufacturer may not have the same safety characteristics as the recommended replacement parts shown in the Parts List of the Service manual and may create shock, fire, or other hazards.
4. The leads in the products are routed and dressed with ties, clamps, tubings, barriers and the like to be separated from live parts, high temperature parts, moving parts and/or sharp edges for the prevention of electric shock and fire hazard. When service is required, the original lead routing and dress should be observed, and it should be confirmed that they have been returned to normal, after re-assembling.

Warning

1. Service should be performed by qualified personnel only.
2. This equipment has been designed and manufactured to meet international safety standards.
3. It is the legal responsibility of the repairer to ensure that these safety standards are maintained.
4. Repairs must be made in accordance with the relevant safety standards.
5. It is essential that safety critical components are replaced by approved parts.
6. If mains voltage selector is provided, check setting for local voltage.

INSTRUCTIONS [These instructions refer to the HR-J455EK/J256EK/J255EK/J255ES]

Safety Precautions

The rating plate and the safety caution are on the rear of the unit.

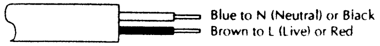
WARNING: DANGEROUS VOLTAGE INSIDE
WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.

IMPORTANT

- Please read the various precautions on p. 2 – 3 of this instruction manual before installing or operating the recorder.
- It should be noted that it may be unlawful to re-record pre-recorded tapes, records, or discs without the consent of the owner of copyright in the sound or video recording, broadcast or cable programme and in any literary, dramatic, musical, or artistic work embodied therein.

IMPORTANT

Connection to the mains supply in the United Kingdom.
DO NOT cut off the mains plug from this equipment. If the plug fitted is not suitable for the power points in your home or the cable is too short to reach a power point, then obtain a proper safety approved extension lead/adapter or consult your dealer.
In the unlikely event of the plug fuse failing be sure to replace the fuse only with an identical approved type, as originally fitted, and to replace the fuse cover. If the fuse fails again consult your nearest JVC dealer.
If nonetheless the mains plug is cut off remove the fuse and dispose of the plug immediately, to avoid a possible shock hazard by inadvertent connection to the mains supply.
If this product is not supplied fitted with a mains plug then follow the instructions given below:
DO NOT make any connection to the Larger Terminal coded E or Green.
The wires in the mains lead are coloured in accordance with the following code:



If these colours do not correspond with the terminal identifications of your plug, connect as follows:
Blue wire to terminal coded N (Neutral) or coloured Black.
Brown wire to terminal coded L (Live) or coloured Red.
If in doubt — consult a competent electrician.

- Cassettes marked "VHS" (or "S-VHS") can be used with this video recorder. However, only VHS recordings can be made and played back.
- HQ VHS is compatible with existing VHS equipment.
- Video Plus+ and PlusCode are trademarks of Gemstar Development Corporation. The Video Plus+ system is manufactured under license from Gemstar Development Corporation.

CAUTION

- When you are not using the recorder for a long period of time, it is recommended that you disconnect the power cord from the mains outlet.
- Dangerous voltage inside. Refer internal servicing to qualified service personnel. To prevent electric shock or fire hazard, remove the power cord from the mains outlet prior to connecting or disconnecting any signal lead or aerial.

The STANDBY/ON ⏻/I button does not completely shut off mains power from the unit, but switches operating current on and off. " ⏻ " shows electrical power standby and " I " shows ON.

Video tapes recorded with this video recorder in the LP (Long Play) mode cannot be played back on a single-speed video recorder.

Failure to heed the following precautions may result in damage to the recorder, remote control or video cassette.

1. **DO NOT place the recorder . . .**
   ... in an environment prone to extreme temperatures or humidity.
   ... in direct sunlight.
   ... in a dusty environment.
   ... in an environment where strong magnetic fields are generated.
   ... on a surface that is unstable or subject to vibration.
2. **DO NOT block the recorder's ventilation openings.**
3. **DO NOT place heavy objects on the recorder or remote control.**
4. **DO NOT place anything which might spill on top of the recorder or remote control.**
5. **AVOID violent shocks to the recorder during transport.**

MOISTURE CONDENSATION

Moisture in the air will condense on the recorder when you move it from a cold place to a warm place, or under extremely humid conditions—just as water droplets form in the surface of a glass filled with cold liquid. Moisture condensation on the head drum will cause damage to the tape. In conditions where condensation may occur, keep the recorder turned on for a few hours to let the moisture dry.

ABOUT HEAD CLEANING

Accumulation of dirt and other particles on the video heads may cause the playback picture to become blurred or interrupted. Be sure to contact your nearest JVC dealer if such troubles occur.

Some Do's And Don'ts On The Safe Use Of Equipment

This equipment has been designed and manufactured to meet international safety standards but, like any electrical equipment, care must be taken if you are to obtain the best results and safety is to be assured.

DO read the operating instructions before you attempt to use the equipment.
DO ensure that all electrical connections (including the mains plug, extension leads and interconnections between pieces of equipment) are properly made and in accordance with the manufacturer's instructions. Switch off and withdraw the mains plug when making or changing connections.
DO consult your dealer if you are ever in doubt about the installation, operation or safety of your equipment.
DO be careful with glass panels or doors on equipment.

DON'T continue to operate the equipment if you are in any doubt about it working normally, or if it is damaged in any way — switch off, withdraw the mains plug and consult your dealer.
DON'T remove any fixed cover as this may expose dangerous voltages.
DON'T leave equipment switched on when it is unattended unless it is specifically stated that it is designed for unattended operation or has a standby mode. Switch off using the switch on the equipment and make sure that your family knows how to do this. Special arrangements may need to be made for infirm or handicapped people.
DON'T use equipment such as personal stereos or radios so that you are distracted from the requirements of road safety. It is illegal to watch television whilst driving.
DON'T listen to headphones at high volume, as such use can permanently damage your hearing.
DON'T obstruct the ventilation of the equipment, for example with curtains or soft furnishings. Overheating will cause damage and shorten the life of the equipment.
DON'T use makeshift stands and NEVER fix legs with wood screws — to ensure complete safety always fit the manufacturer's approved stand or legs with the fixings provided according to the instructions.
DON'T allow electrical equipment to be exposed to rain or moisture.

ABOVE ALL...

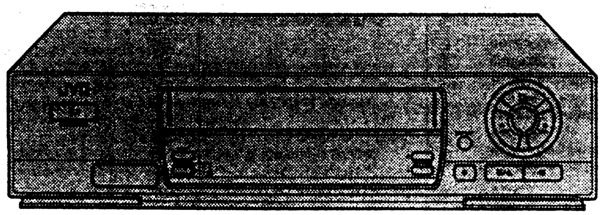
- — **NEVER** let anyone especially children push anything into holes, slots or any other opening in the case — this could result in a fatal electrical shock;
- — **NEVER** guess or take chances with electrical equipment of any kind — it is better to be safe than sorry!

Dear Customer,

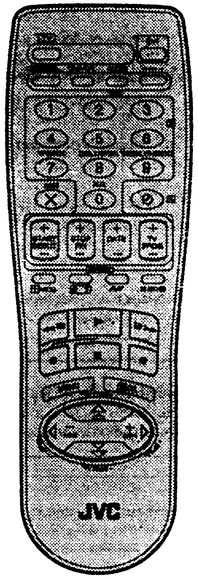
Thank you for purchasing this JVC Video Cassette Recorder.
Please use this **QUICK SET UP GUIDE** to help you to set up your video cassette recorder.

STEP 1 CHECK THE CONTENTS

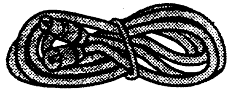
CHECK ALL THE CONTENTS SHOWN BELOW



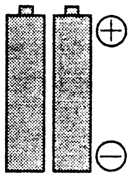
Video Cassette Recorder



Infrared Remote Control Unit



RF Cable



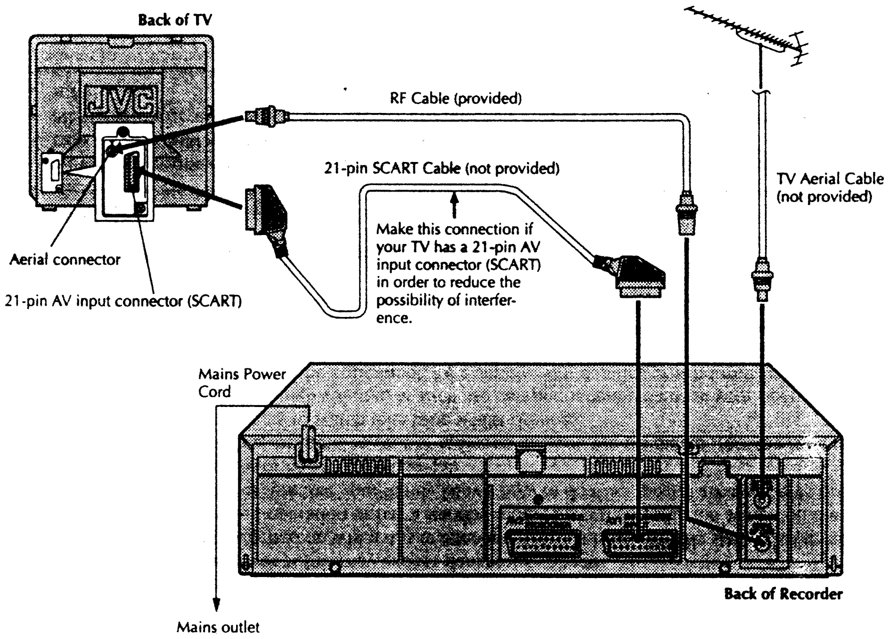
"AA" Batteries (x 2)

You are now ready to install your video recorder.

STEP 2 INSTALLATION

CONNECT VIDEO RECORDER TO TV

Place the recorder on a stable, flat surface.


Back of TV
RF Cable (provided)
21-pin SCART Cable (not provided)
TV Aerial Cable (not provided)
Make this connection if your TV has a 21-pin AV input connector (SCART) in order to reduce the possibility of interference.
Aerial connector
21-pin AV input connector (SCART)
Mains Power Cord
Back of Recorder
Mains outlet

RF CONNECTION

To Connect To A TV With NO 21-pin AV input connector (SCART) . . .

1- Disconnect the TV aerial cable from the TV.
2- Connect the TV aerial cable to the ANT. IN jack on the rear panel of the recorder.
3- Connect the provided RF cable between the RF OUT jack on the rear panel of the recorder and the TV's aerial connector.

AV CONNECTION

To Connect To A TV with 21-pin AV input connector (SCART) . . .

1- Connect the aerial, recorder and TV as per "RF CONNECTION".
2- Connect an optional SCART cable between the AV1 IN/OUT socket on the rear panel of the recorder and the TV's 21-pin AV input connector (SCART).

ATTENTION

- Do NOT Plug the mains power cord into a mains outlet until all connections are completed.
- Do NOT press the ⏻/I button on the recorder or on the remote control to turn on the recorder's power before you start the Auto Set Up procedure described on page 8.

AFTER YOU FINISH THIS STEP > Go to Step 3 – VIDEO CHANNEL SET

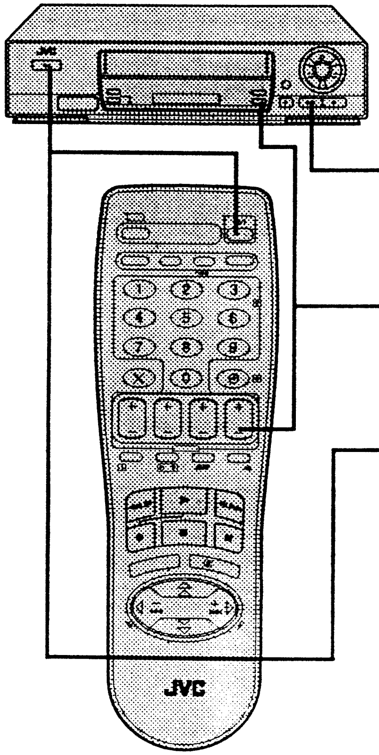
STEP 3 VIDEO CHANNEL SET

TUNE THE TV TO VIDEO RECORDER

Video channel (RF output channel) is the channel on which your TV receives picture and sound signals from the video recorder through the RF cable.

- ***If you have connected the video recorder to your TV via both an RF cable and a 21-pin SCART cable (AV connection), you do not need the video channel so you have to set the video channel to off. — Go to "With AV Connection" below.***
- ***If you have connected the video recorder to your TV via an RF cable only (RF connection), you have to set the correct video channel — Go to "With RF Connection" on page 7.***

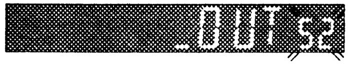
With AV Connection



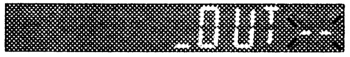
Before performing the following procedure, make sure that:

- the mains power cord is plugged into the mains outlet.
- the video recorder is turned off and there is no cassette inserted in the recorder.
- batteries have been installed in the remote control.

1 Press and hold down **STOP(■/≜)** on the recorder until the display panel shows the following.



2 Press **TV PROG –** until the display panel shows "-OUT- -".



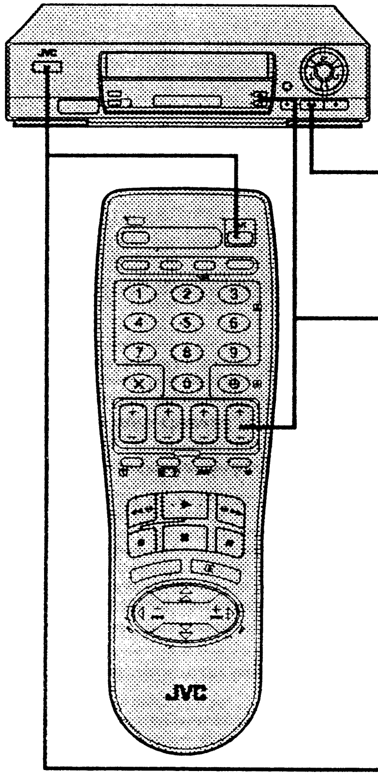
- Now the Video Channel is set to off.

3 Press ⏻/I to turn off the recorder.

To view picture signals from the video recorder, set your TV to its AV mode. — Refer to the instructions supplied with your TV set for how to do this.

AFTER YOU FINISH THIS STEP ▷ *Go to Step 4 – AUTO SET UP*

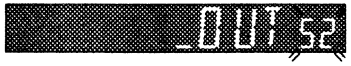
With RF Connection



Before performing the following procedure, make sure that:

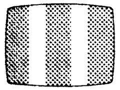
- the mains power cord is plugged into the mains outlet.
- the video recorder is turned off and there is no cassette inserted in the recorder.
- the connected TV is turned on.
- batteries have been installed in the remote control.

1 Press and hold down **STOP(■/≜)** on the recorder until the display panel shows the following.



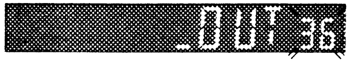
2 Set your TV to UHF channel 52. (Refer to the instructions supplied with your TV set for how to do this.)

- If the two vertical white bars appear clearly on the screen as shown to the right, go to item **3**.



- If the two vertical white bars do not appear clearly, press **TV PROG +** or – to set the video recorder to a vacant channel between 28 and 60 which is not occupied by any local station in your area.
  Refer to list on page 36 for details of broadcast stations in your area.

(Ex.) If channel 36 is available in your area.



Then set your TV to UHF channel 36 and check if the two vertical white bars appear clearly on the screen; if so, go to item **3**. If not, re-set the video recorder to another vacant channel and try again.

3 Press ⏻/I to turn off the recorder.

*The channel on which the screen in item **2** appears clearly is your Video Channel.*
To view picture signals from the video recorder, set your TV to the Video Channel.

IMPORTANT

- If you set the video recorder to a channel which is occupied by a local station or has neighbouring channels that are occupied by local stations, the picture reception quality will be affected and some interference noise will appear on the TV screen. Be sure to select a vacant channel which has no broadcast on neighbouring channels.
- If you cannot obtain the two vertical white bars clearly with any channel between 28 and 60, consult your JVC dealer.

AFTER YOU FINISH THIS STEP ▷ *Go to Step 4 – AUTO SET UP*

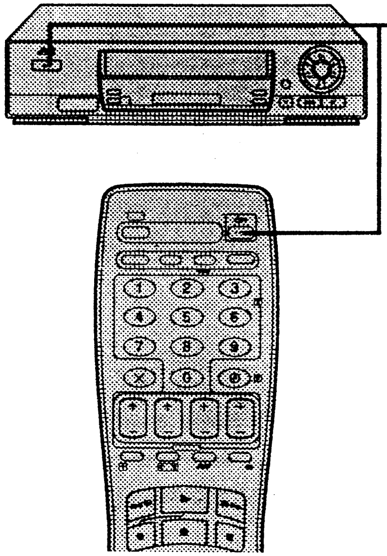
STEP 4 AUTO SET UP

SET THE TUNER CHANNELS, CLOCK AND GUIDE PROGRAM NUMBERS

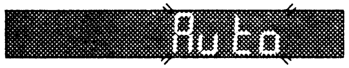
The Auto Set Up function sets the tuner channels, clock and Video Plus+ assigned Guide Program numbers automatically the first time the ⏻/I button on the recorder or on the remote is pressed to turn on the recorder after the mains power cord has been plugged into a mains outlet.

Before performing the following procedure, make sure that:

- ■ the TV aerial cable is connected to the recorder.
- ■ the mains power cord is plugged into the mains outlet.

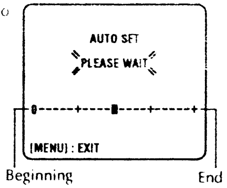


1 Press ⏻/I.



"Auto" appears on the display panel and blinks; do NOT press any button on the recorder or remote control until the display panel shows either the current time or "(PR)1" or "– – :– –". (Refer to box on page 9.) Auto Set Up usually takes about 4 – 12 minutes; the duration varies by area.

- Auto channel set function takes place first; it assigns automatically all receivable stations in your area.
- Auto clock set function sets the clock automatically.
- During auto channel set, the recorder recognizes each station name of the detected stations and stores them in the recorder's memory, then automatically sets the Video Plus+ assigned Guide Program number for those stations according to the broadcast area.
- If the TV power is on and its video channel or AV mode is selected during Auto Set Up, the AUTO SET screen will appear.



- If there is power cut or if you press ⏻/I or **MENU** while Auto Set Up is in progress, Auto Set Up will be interrupted; be sure to turn off the recorder power once and press ⏻/I to turn the power back on in order to re-start Auto Set Up.

IMPORTANT

- ■ In certain reception conditions, station names may not be stored correctly, and auto Guide Program Number Set may not work properly. If the Guide Program numbers are not set properly, when you timer-record a TV programme using Video Plus+, the recorder will record a TV programme of a different station. When programming the timer using Video Plus+, be sure to check that the preset position corresponding to the broadcasting station you wish to record has been selected (☞ pg. 14, "Video Plus+ Timer Programming").
- ■ Your video recorder memorizes all detected stations even if reception of some of them is poor. In these cases picture quality may be poor. To delete those stations which have an unacceptable picture ☞ "Delete A Channel" on page 33.
- ■ If any of the above problems occur, refer to pages 32 – 34 to input station names (☞ "Set Stations") or delete unnecessary stations (☞ "Delete A channel"). You can also change station preset positions (☞ "Change Station Preset Position").

ATTENTION

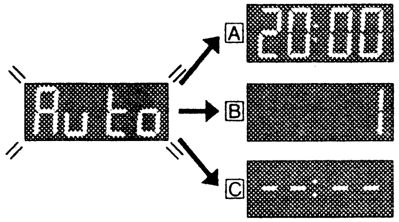
Once you have performed Auto Set Up, all the stored stations and their Guide Program numbers remain in the recorder's memory and the recorder will not perform Auto Set Up again. If there is a power cut and the recorder's memory backup expires you only need to reset the clock. (☞ pg. 37)

If you have moved to a different area, perform each setting as required.

- ■ Tuner setting ☞ pg. 30
- ■ Clock setting ☞ pg. 37

If a new station begins broadcasting in your area, perform tuner setting (☞ pg. 30).

Auto Set Up results appear on the display panel



A When both auto channel set and auto clock set have been completed successfully the correct current time will be displayed.

B When auto channel set has been completed successfully but auto clock set has not, "(PR)1" will be displayed.

C When neither auto channel set nor auto clock set has been completed successfully, "--:--" will be displayed.

* You can check if the Guide Program numbers have been set correctly when you perform Video Plus+ Timer Programming (☞ pg. 14); if the correct preset position number is displayed in step **3**, this confirms that the Guide Program number for the PlusCode number you enter in step **2** has been set correctly.

A If both auto channel set and auto clock set have been performed successfully:

1 Turn on the TV and select its VIDEO channel or AV mode, then make sure that all necessary stations have been stored in the recorder's memory by using the **TV PROG** button(s).

- If station names (ID — ☞ pg. 35) have also been stored in the recorder's memory, the station name will be displayed at the top left corner of the screen for about 5 seconds each time the recorder is tuned to a different station.
- If you want to set the tuner manually such as to add or skip channels, to change preset positions, or to set or change station names, see pages 32 – 34.

Now you have finished the basic set up and can use your recorder for both playback and recording.

B If auto channel set has succeeded but auto clock set has not:

1 Turn on the TV and select its VIDEO channel or AV mode, then make sure that all necessary stations have been stored in the recorder's memory by using the **TV PROG** button(s).

- If station names (ID — ☞ pg. 35) have also been stored in the recorder's memory, the station name will be displayed at the top left corner of the screen for about 5 seconds each time the recorder is tuned to a different station.
- If you want to set the tuner manually such as to add or skip channels, to change preset positions, or to set or change station names, see pages 32 – 34.

2 Perform "Clock Set" on page 37.

Now you have finished the basic set up and can use your recorder for both playback and recording.

C If both auto channel set and auto clock set have failed:

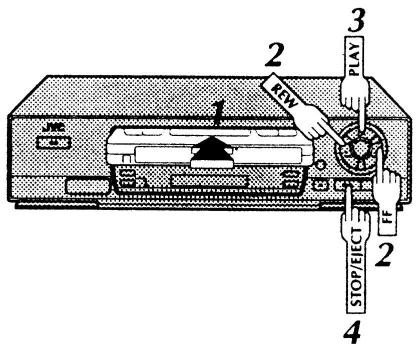
1 Make sure the TV aerial cable is connected properly to the recorder and turn off the recorder power once, then turn the recorder power back on again.

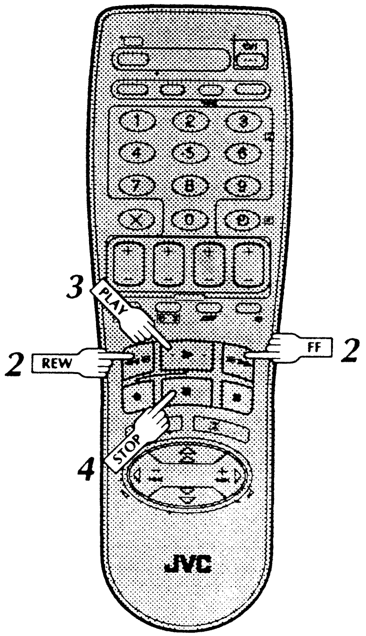
- The recorder will try Auto Set Up again.

If you have any difficulty with the above procedures call the JVC Customer Service Hot Line on 0181 208 7654

Playback

Turn on the TV and select the VIDEO channel (or AV mode).





The easiest, most basic operation possible with your video recorder is tape playback. Already-recorded signals on a video tape are read by your video recorder and displayed on your TV just like a TV programme.

1 LOAD A CASSETTE

Make sure the window side is up, the rear label side is facing you and the arrow on the front of the cassette is point toward the recorder. Don't apply too much pressure when inserting.

- The recorder power comes on automatically and the counter is reset to 0:00:00.
- If the record safety tab has been removed, playback begins automatically.

2 FIND PROGRAMME START POINT

If the tape is advanced past the start point, press **REW**. To go forward, press **FF**.

3 START PLAYBACK

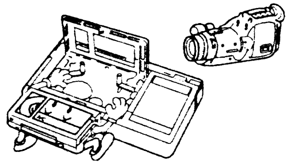
Press **PLAY**. "BEST" appears blinking in the recorder's display panel during automatic tracking (☞ pg. 20)

- Playback picture quality of LP recordings will not be as high as SP recordings.

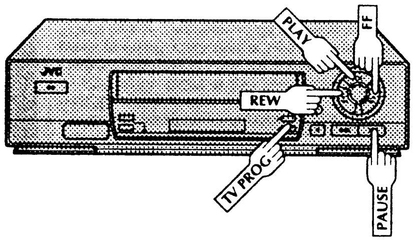
4 STOP PLAYBACK

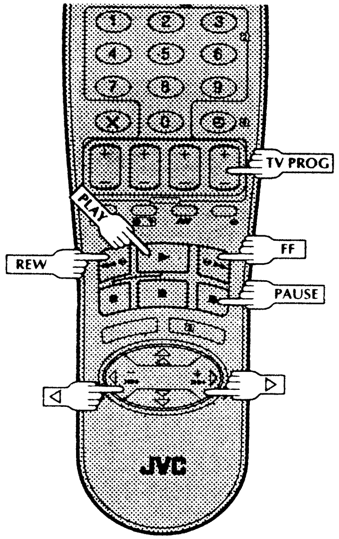
Press **STOP** on the remote or **STOP/EJECT** on the recorder's front panel. Then press **STOP/EJECT** to remove the cassette.

Usable cassettes



- Compact VHS camcorder recordings can be played on this video recorder. Simply place the recorded cassette into a VHS Cassette Adapter and it can be used just like any full-sized VHS cassette.
- This video recorder can record on regular VHS and Super VHS cassettes. However, it will record and play back regular VHS signals only. It is not possible to play back a recorded Super VHS tape.





High-Speed Search

1 ACTIVATE HIGH-SPEED SEARCH

During playback or still picture, press **FF** for forward high-speed search, or **REW** for reverse high-speed search.

To resume normal playback, press **PLAY**.

NOTE:

*For short searches, press and hold **FF** or **REW** for more than 2 seconds during playback or still picture. When released, normal playback resumes.*

Still Picture/Frame-By-Frame Playback

1 PAUSE DURING PLAYBACK

Press **PAUSE**. If there is vertical jitter, use the **TV PROG** buttons to correct the picture.

2 ACTIVATE FRAME-BY-FRAME PLAYBACK

Press **PAUSE**. Each time **PAUSE** is pressed the tape will advance one frame.

OR

Press ◁ or ▷. Each time one of these buttons is pressed the tape will move one frame in the direction of the arrow.

To resume normal playback, press **PLAY**.

Slow Motion

1 ACTIVATE SLOW-MOTION PLAYBACK

During still picture, press and hold **PAUSE** for 2 seconds, then release. Press and release again to return to still picture.

OR

During still picture, press and hold ◁ or ▷. Release to return to still picture.

To resume normal playback, press **PLAY**.

Variable-Speed Search

1 ACTIVATE VARIABLE-SPEED SEARCH

During playback, press ◁ or ▷.

- The more times you press, the faster the playback picture moves.
- To decrease speed, press the button for the opposite direction.

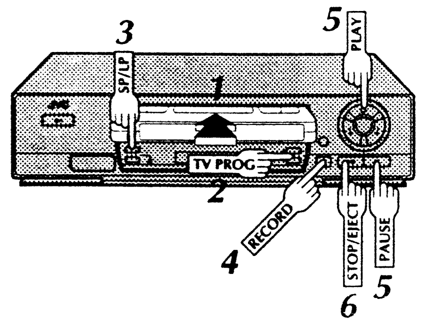
To resume normal playback, press **PLAY**.

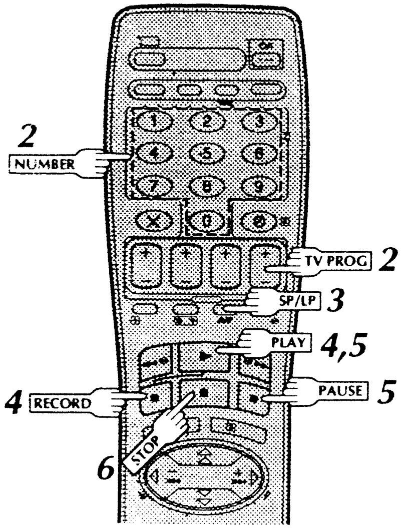
ATTENTION

In the search, still, slow-motion or frame-by-frame playback mode,
- the picture will be distorted.
- noise bars will appear.
- there will be loss of colour with a tape recorded in LP mode.

Recording

Turn on the TV and select the VIDEO channel (or AV mode).





Recording Resume Function

If there is a power outage during recording (or Instant Timer Recording or timer recording), the recording will resume automatically when power is restored to the recorder unless the recorder's memory backup has expired.

TV signals being received by the recorder's built-in tuner can be recorded onto a video tape. You can "capture" a TV programme using your video recorder.

1

LOAD A CASSETTE

Insert a cassette with the record safety tab intact (see below).

- The counter is reset to 0:00:00 and the recorder power comes on automatically.

2

CHOOSE A PROGRAMME

Press **TV PROG** +/– or the **NUMBER** keys to select the preset you wish to record.

3

SET TAPE SPEED

Press **SP/LP** (////). Check the SP/LP indicator on the recorder display panel to confirm the selected tape speed.

- Picture quality of LP recordings will not be as high as on SP recordings.

4

START RECORDING

Press and hold **RECORD** and press **PLAY** on the remote control, or press **RECORD** on the recorder.

B.E.S.T. takes place at the beginning of both the first SP and the first LP recording after inserting the cassette (☞ pg. 20).

- You can not change the preset whilst recording is in progress. To change the preset, see step 5.

5

PAUSE/RESUME RECORDING

Press **PAUSE**. Press **PLAY** to resume recording.

- During the Record Pause mode, you can change the preset by pressing the **TV PROG** +/– buttons or the **NUMBER** keys.

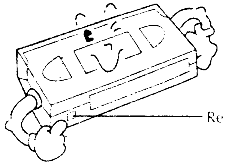
6

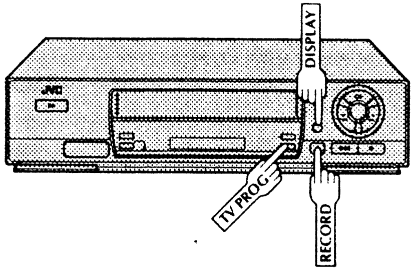
STOP RECORDING

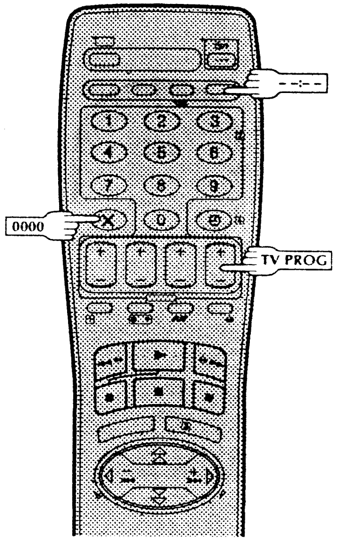
Press **STOP** on the remote control or **STOP/EJECT** on the recorder. Then press **STOP/EJECT** to remove the cassette.

Accidental erasure prevention

- To prevent accidental recording on a recorded cassette, remove its safety tab. To record on it later, cover the hole with adhesive tape.







Tape Remaining Time

1

DISPLAY REMAINING TIME

Press **DISPLAY** (or – –:– –) until the time remaining on the tape appears.

- The display panel shows the tape remaining time with "◺" displayed.
- By pressing the **DISPLAY** (or – –:– –) button, you can change the display to show the counter reading, preset position*, clock time or tape remaining time

** Preset position is not displayed during playback*

NOTE:

Depending on the type of tape used, there may be times when the tape remaining time reading may not appear right away, or is not correct. "– –:– –" may sometimes appear, or the display may blink on occasion.

Record One Programme While Watching Another

1

SELECT PRESET TO WATCH

Once recording is in progress, all you need to do is to set the preset controls on the TV for the station you wish to view.

- The programme selected with the TV's preset controls appears on the TV screen while the one selected with the recorder's **TV PROG** buttons is recorded on the tape.

Elapsed Recording Time Indication

You can check the exact time of a recording.

1

SET COUNTER DISPLAY

Press **DISPLAY** (or – –:– –) until a counter reading appears on the dispay panel.

2

RESET COUNTER

Press **0000** before starting recording or playback.

- The counter is reset to "0:00:00" and shows the exact elapsed time as the tape runs.

Instant Timer Recording (ITR)

This easy method allows you to record for any length of time from 30 mins. to 6 hours (selectable in 30-min. increments), and shuts off the recorder after recording is finished.

1

START RECORDING

Press **RECORD** on the recorder.

2

ENGAGE ITR MODE

Press **RECORD** again. "○" blinks and 0:30 appears on the front display panel.

3

SET RECORDING DURATION

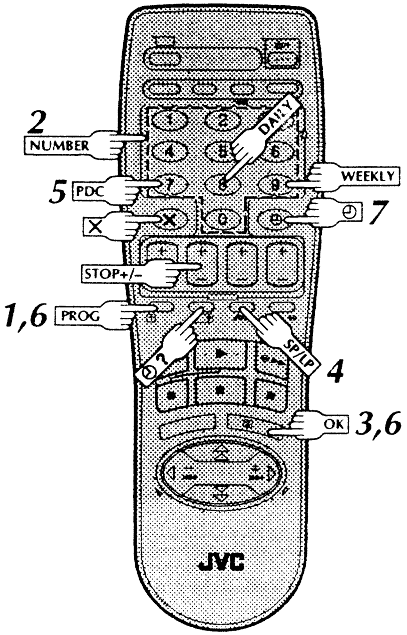
If you want to record for more than 30 minutes, press **RECORD** to extend the time. Each press extends recording time by 30 minutes.

NOTES:

- *You can only perform ITR using the **RECORD** button on the recorder's front panel.*
- *After you set the ITR time, the counter display appears.*
- *To check the remaining time, press **RECORD** once during recording and the remaining time will be displayed for about 5 seconds. Be careful not to press **RECORD** again within these 5 seconds, or you will round the recording time up to the next 30 minute increment.*

Video Plus+ Timer Programming

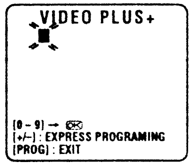
Before performing Video Plus+ Timer Programming:
- Make sure that the recorder's built-in clock is set properly.
- Insert a cassette with the safety tab in place. The recorder will come on automatically.
- Turn on the TV and select the VIDEO channel (or AV mode).



With Video Plus+, timer programming is greatly simplified because each TV programme has a corresponding code number which your recorder is able to recognise.

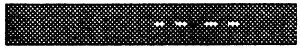
1 ACCESS VIDEO PLUS+ SCREEN

Press **PROG**.


VIDEO PLUS+

[0 – 9] → OK
[+/–] : EXPRESS PROGRAMING
[PROG] : EXIT

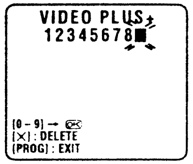
The front display panel looks like this:



2 ENTER PLUSCODE NUMBER

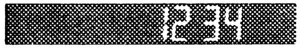
Press the **NUMBER** keys to enter the PlusCode number of the programme you wish to record.

- If you make a mistake, press X and input the correct number.


VIDEO PLUS+
12345678■

[0 – 9] → OK
[X] : DELETE
[PROG] : EXIT

The PlusCode number you enter appears on the front display panel:

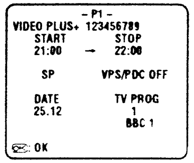


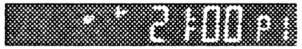
The display panel shows only a 4-digit number.

3 ACCESS VIDEO PLUS+ PROGRAM SCREEN

Press **OK**, and the Video Plus+ Program screen appears (if you're just starting out, "P1" appears).

The display panel shows the programme start time. Pressing ⊕ **?** changes the display to the programme stop time, then the date and preset position.


– P1 –
VIDEO PLUS+ 123456789
START → STOP
21:00 → 22:00
SP VPS/PDC OFF
DATE 25.12
TV PROG 1 BBC 1
OK: OK



IMPORTANT
Make sure the preset position number you wish to record is displayed; if not, see "Video Plus+ Setup" on page 38 and set the Guide Program number for that PlusCode number correctly.

- If the number you entered is invalid, "ERROR" appears on the screen and "Err" appears on the display panel. Press X and input a valid PlusCode number.
- If the "GUIDE PROG SET" screen appears, see "ATTENTION – Regarding Guide Program Number Set" on page 15.

4 SET TAPE SPEED

Press **SP/LP (▶/▶▶)** to set the tape speed.

5 SET PDC MODE

Press **PDC** to select "ON" or "OFF".
If "VPS/PDC ON" is displayed on the screen or "VPS/PDC" is lit on the display panel, PDC is set to ON.
If "VPS/PDC OFF" is displayed on the screen or "VPS/PDC" is not lit on the display panel, PDC is set to OFF.
☞ "PDC Recording" in the right column.

- VPS (Video Programme System) recording is not currently available in the U.K. and not possible with this recorder.

6 RETURN TO NORMAL SCREEN

Press **PROG** or **OK**. "PROGRAM COMPLETED" appears on the screen for about 5 seconds, then normal screen appears.

- Repeat steps **1** – **6** for each additional programme.

7 ENGAGE RECORDER'S TIMER MODE

Press ⊕. The recorder turns off automatically and ⊕ appears on the display panel.

- To disengage the timer, press ⊕ again.

NOTES:

- *To Change The Stop Time . . .*
  *. . . press **STOP +/–** after pressing **OK** in step **3**. You can compensate for anticipated programme schedule delays this way.*
- *To Timer-Record Weekly Or Daily Serials . . .*
  *. . . after pressing **OK** in step **3**, press **WEEKLY** (**NUMBER** key "9") for weekly serials or **DAILY** (**NUMBER** key "8") for daily serials (Monday – Friday). Either "WEEKLY" or "DAILY" appears on the screen. Pressing the button again makes the corresponding indication disappear.*
- *You can programme this recorder to timer-record as many as 8 programmes. If you try to programme the recorder to record a ninth, "PROGRAM FULL" appears on screen and "FULL" appears on the front display panel. To record the extra programme, you must first cancel any unnecessary programmes ☞ pg. 18).*
- *It is not possible to timer-record a TV programme with a PlusCode number which starts with "0".*

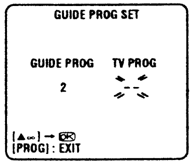
Satellite Receiver Users
To timer-record a satellite broadcast using Video Plus+:
1. Perform steps **1** – **7**.
2. Set the satellite receiver to the appropriate channel before the selected programme begins.
3. Leave the satellite receiver's power on.

ATTENTION

Regarding Guide Program Number Set

"GUIDE PROG SET" appears after performing step **3** if the Guide Program number for the PlusCode number you entered has not been set.

- Press the **NUMBER** keys or △▽ to input the preset position number on which your recorder receives that station, then press **OK** or ▷. The Video Plus+ Program screen appears.


GUIDE PROG SET
GUIDE PROG 2
TV PROG --
[▲▼] → OK
[PROG] : EXIT

(Ex.) To timer-record a BBC2 programme with Video Plus+.
* If your recorder receives BBC2 on the preset position 2, press **OK** or ▷ after entering "2".

PDC Recording

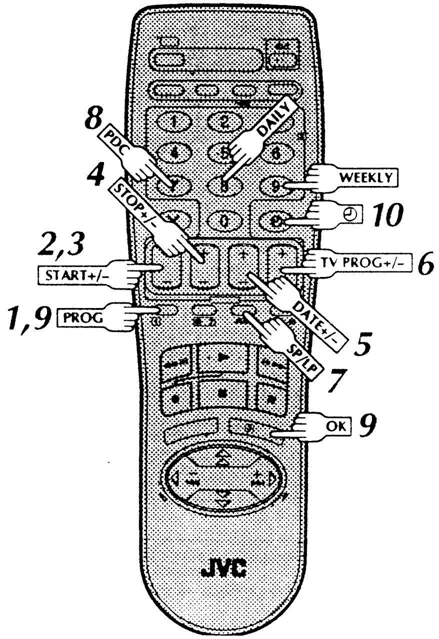
Now available from some TV stations, PDC (Programme Delivery Control) is a service designed to assure safe, accurate timer recording. With this system, special code signals are transmitted together with the audio/video signals. These code signals control your video recorder and have precedence over the advertised times which you may have preset into the timer. This means that your recorder will start and stop recording when the preset TV programmes actually start and end — even if the broadcast time of a preset TV programme is changed from what has been advertised. PDC is currently only available nationally on Ch.4 and Ch.5. Ch.3 operates a PDC service in some parts of the country and BBC1 & BBC2 currently have no PDC service. All channels intend to offer this service in due course. Check your TV programme listing guide for latest information. If the channel you intend to record does not offer a PDC service your recorder will not start recording if PDC has been selected. Be sure to set PDC to "OFF" if PDC is not available on your selected channel. (☞ step **5** in the left column).

NOTES:

- *PDC recording is also possible when a satellite receiver or a cable system is connected to AV2 IN on your recorder.*
- *PDC recording is also possible via the AV1 IN/OUT connector.*

Express Timer Programming

Before performing Express Timer Programming:
- Make sure that the recorder's built-in clock is set properly.
- Insert a cassette with the safety tab in place. The recorder will come on automatically.
- Turn on the TV and select the VIDEO channel (or AV mode).



If you don't know the PlusCode number for the programme you wish to record, use the following procedure to set your recorder to timer-record the programme.

1

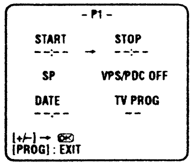
ACCESS VIDEO PLUS+ SCREEN

Press **PROG**.

2

ACCESS PROGRAMME SCREEN

Press **START +/–**. (If you're just starting out, "P1" appears.)



- P1 -

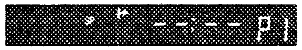
START --:-- → STOP --:--

SP VPS/PDC OFF

DATE --.-- TV PROG --

[+/–] → OK
[PROG] : EXIT

The front display panel looks like this:

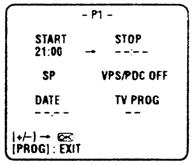


3

ENTER PROGRAMME START TIME

Press **START +/–** to enter the time you want recording to start.

- Press and hold **START +/–** to move in 30-minute increments, or press and release repeatedly to move 1 minute at a time.



- P1 -

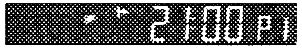
START 21:00 → STOP --:--

SP VPS/PDC OFF

DATE --.-- TV PROG --

[+/–] → OK
[PROG] : EXIT

The front display panel looks like this:



4

ENTER PROGRAMME STOP TIME

Press **STOP +/–** to enter the time you want recording to stop.

- Press and hold **STOP +/–** to move in 30-minute increments, or press and release repeatedly to move 1 minute at a time.

5

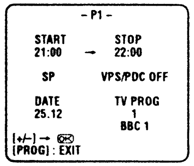
ENTER PROGRAMME DATE

Press **DATE +/–** to enter the date on which you wish to record. (The current date first appears on screen. The date you enter will appear in its place.)

6

ENTER PRESET POSITION

Press **TV PROG +/–** to enter the preset position corresponding to the broadcasting station you wish to record.



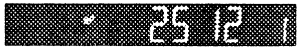
- P1 -

START 21:00 → STOP 22:00

SP VPS/PDC OFF

DATE 25.12 TV PROG 1 BBC 1

[+/–] → OK
[PROG] : EXIT



7

SET TAPE SPEED

Press **SP/LP (▱/▱▱)** to set the tape speed.

8

SET PDC MODE

Press **PDC** to select "ON" or "OFF".
If "VPS/PDC ON" is displayed on the screen or "VPS/PDC" is lit on the display panel, PDC is set to ON.
If "VPS/PDC OFF" is displayed on the screen or "VPS/PDC" is not lit on the display panel, PDC is set to OFF.
☞ "PDC Recording" in the right column.

- VPS (Video Programme System) recording is not currently available in the U.K. and not possible with this recorder.

9

RETURN TO NORMAL SCREEN

After confirming all information is correct, press **PROG** or **OK**. "PROGRAM COMPLETED" appears on the screen for about 5 seconds, then normal screen appears.

- Repeat steps **1** – **9** for each additional programme.

10

ENGAGE RECORDER'S TIMER MODE

Press ⊕. The recorder turns off automatically and ⊕ appears on the display panel.

- To disengage the timer, press ⊕ again.

To Timer-Record Weekly Or Daily Serials . . .
. . . anytime during steps 2 through 9, press **WEEKLY (NUMBER** key "9") for weekly serials or **DAILY (NUMBER** key "8") for daily serials (Monday – Friday). Either "WEEKLY" or "DAILY" appears on the screen. Pressing the button again makes the corresponding indication disappear.

NOTE:

You can programme this recorder to timer-record as many as 8 programmes. If you try to programme the recorder to record a ninth, "PROGRAM FULL" appears on screen and "FULL" appears on the front display panel. To record the extra programme, you must first cancel any unnecessary programmes (☞ pg. 18).

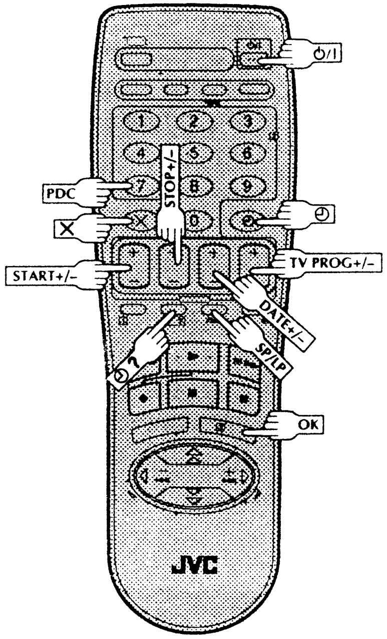
Satellite Receiver Users
To timer-record a satellite broadcast using Express Timer Programming:
1. Perform steps **1** – **10**. Enter "L-2" for the preset position in step **6**.
2. Set the satellite receiver to the appropriate channel before the selected programme begins.
3. Leave the satellite receiver's power on.

PDC Recording

Now available from some TV stations, PDC (Programme Delivery Control) is a service designed to assure safe, accurate timer recording. With this system, special code signals are transmitted together with the audio/video signals. These code signals control your video recorder and have precedence over the advertised times which you may have preset into the timer. This means that your recorder will start and stop recording when the preset TV programmes actually start and end — even if the broadcast time of a preset TV programme is changed from what has been advertised. PDC is currently only available nationally on Ch.4 and Ch.5. Ch.3 operates a PDC service in some parts of the country and BBC1 & BBC2 currently have no PDC service. All channels intend to offer this service in due course. Check your TV programme listing guide for latest information. If the channel you intend to record does not offer a PDC service your recorder will not start recording if PDC has been selected. Be sure to set PDC to "OFF" if PDC is not available on your selected channel. (☞ step **8** in the left column).

NOTES:

- *Set the start time (PDC time) exactly as advertised in the TV listing. A different time than advertised will result in no recording.*
- *PDC recording is also possible when a satellite receiver or a cable system is connected to AV2 IN on your recorder.*
- *PDC recording is also possible via the AV1 IN/OUT connector.*



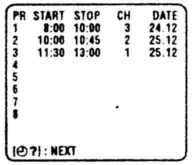
Check, Cancel And Replace Programmes

1 DISENGAGE TIMER MODE

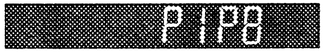
Press ⊖, then press ⏻/I.

2 ACCESS PROGRAM CHECK SCREEN/DISPLAY

Press ⊕ ?.

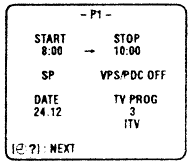


```
PR START  STOP   CH   DATE
1   8:00  10:00   3   24.12
2  10:00  10:45   2   25.12
3  11:30  13:00   1   25.12
4
5
6
7
8

[⊕?] : NEXT
```

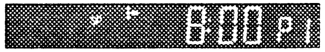


3 ACCESS PROGRAM SCREEN/ DISPLAY

Press ⊕ ? again to check more information. Each time you press ⊕ ?, the next programme's information appears.



```
          – P1 –
START             STOP
 8:00     →      10:00

 SP          VPS/PDC OFF

DATE            TV PROG
24.12              3
                  ITV
[⊕?] : NEXT
```



- The display panel shows the programme start time. Pressing **OK** changes the display to the programme stop time, then the date and the preset position.

To cancel or replace a programme...

4 CANCEL OR REPLACE A PROGRAMME

Press X to cancel a programme. To replace a programme, press the appropriate button: **START+/–**, **STOP+/–**, **DATE+/–**, **TV PROG+/–**, **SP/LP** (////), **PDC**.

5 RETURN TO NORMAL SCREEN/ DISPLAY

Press ⊕ ? as many times as necessary. If there are still some programmes to be recorded, go on to step **6**.

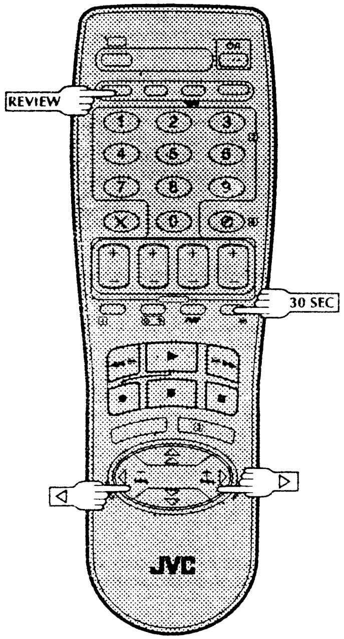
6 RETURN TO TIMER MODE

Press ⊖.

NOTE:

You can also check the programmes on the display panel even when the recorder's power is off or the recorder is in the Timer mode. However it is not possible to cancel or replace the programmes.

Looking For The Scene You Want



Skip Search

1 SKIP OVER UNWANTED SECTIONS

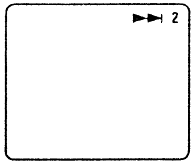
Press **30 SEC** 1 to 4 times during playback. Each press initiates a 30-second period of fast-motion playback. Normal playback resumes automatically.

NOTE:

To return to normal playback during a Skip Search, press **PLAY**.

Index Search

Your recorder automatically marks index codes at the beginning of each recording. This function gives you quick access to any one of 9 index codes in either direction.



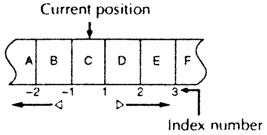
NOTE:

Before starting, make sure the recorder is in the Stop mode.

1 ACTIVATE INDEX SEARCH

Press ◁ or ▷ (|◀◀ or ▶▶|). "|◀◀ 1" or "▶▶| 1" is displayed on screen and search begins in the corresponding direction.

- To access index codes 2 through 9, press ◁ or ▷ repeatedly until the correct index number is displayed.
  Ex.: To locate the beginning of B from the current position, press ◁ twice.
  To locate the beginning of D from the current position, press ▷ once.



- When the specified index code is located, playback begins automatically.

Instant ReView

Simply by pressing a single button, the recorder power comes on, rewinds, and begins playback of the last timer-recorded programme. If you have several programmes recorded, you can easily access any of them.

NOTE:

Before starting, make sure that the recorder is off and that the Timer mode is disengaged.

1 ACTIVATE INSTANT REVIEW

Press **REVIEW**. The recorder power comes on and the recorder searches for the index code indicating the start of the last timer-recorded programme. Once it's found, playback begins automatically.

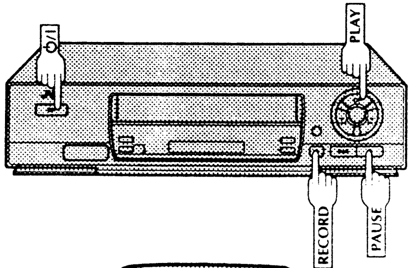
- The front display panel tells you how many programmes have been timer-recorded. If you have, for example, 3 programmes, "REVIEW" and "3" appear and blink. To watch the first of the 3 programmes, press **REVIEW** three times. The recorder searches and begins playback automatically. You can access a programme as far as 9 index codes away from the current tape position.

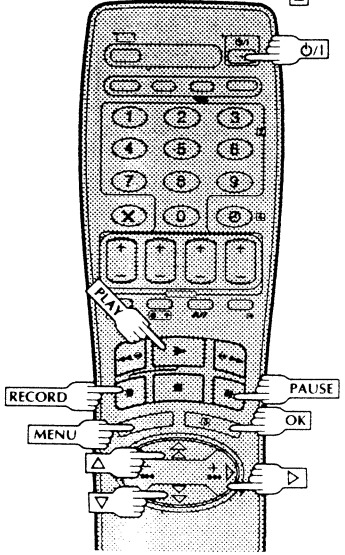
NOTES:

- *Instant ReView is not possible while the recorder is in the Timer mode.*
- *The number of recorded programmes will not be displayed on the front display panel after Auto Satellite Programme recording (☞ pg. 23).*

Playback/ Recording According To Tape Characteristics

Turn on the TV and select the VIDEO channel (or AV mode).





B.E.S.T. Picture System

The B.E.S.T. (Biconditional Equalised Signal Tracking) system checks the condition of the tape in use during recording and playback, and compensates to provide the highest-possible recording and playback pictures. The default setting for both recording and playback is "ON".

1 TURN ON THE RECORDER

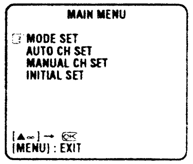
Press ⏻/I.

2 ACCESS MAIN MENU SCREEN

Press **MENU**.

3 ACCESS MODE SET SCREEN

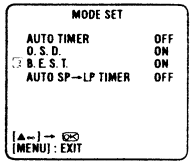
Press △▽ to place the pointer next to "MODE SET", then press **OK** or ▷.



```
MAIN MENU

☞ MODE SET
  AUTO CH SET
  MANUAL CH SET
  INITIAL SET

[▲∞] → OK
[MENU] : EXIT
```

4 SELECT B.E.S.T. MODE

Press △▽ to place the pointer next to "B.E.S.T.", then press **OK** or ▷ to set to "ON" or "OFF".



```
MODE SET

  AUTO TIMER           OFF
  O. S. D.             ON
☞ B. E. S. T.          ON
  AUTO SP→LP TIMER     OFF

[▲∞] → OK
[MENU] : EXIT
```

5 RETURN TO NORMAL SCREEN

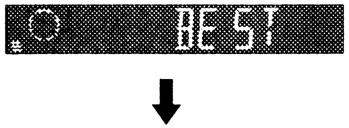
Press **MENU**.

Recording

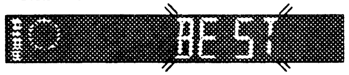
1 START RECORDING

Press and hold **RECORD** and press **PLAY** on the remote, or press **RECORD** on the recorder.

DURING B.E.S.T.



B.E.S.T. COMPLETE



- The recorder spends approximately 7 seconds assessing the condition of the tape, then begins recording.

NOTES:

- *The B.E.S.T. system works for both SP and LP modes only after a tape has been inserted and the Record mode is first initiated. It does not work during recording.*
- *The B.E.S.T. system does not work while Auto Satellite Prog recording is in progress (☞ pg. 23).*
- *In the case of timer recording, the B.E.S.T. system works before recording is initiated.*
- *Once the cassette is ejected, the B.E.S.T. data is cancelled. The next time the cassette is used for recording, B.E.S.T. is re-performed.*
- *Pressing the recorder's **RECORD** button while "BEST" is displayed does not start Instant Timer Recording (☞ pg. 13).*

ATTENTION:

*Since the B.E.S.T. system works before recording actually starts, there is a delay of approximately 7 seconds after **RECORD** and **PLAY** on the remote are pressed, or **RECORD** on the recorder is pressed. To make sure you record the desired scene or programme in its entirety, first perform the following steps:*

*1) Press and hold **PAUSE** and press **RECORD** to engage the RECORD PAUSE mode.*
  - *The recorder then automatically checks the condition of the tape and, after approximately 7 seconds, re-enters RECORD PAUSE.*

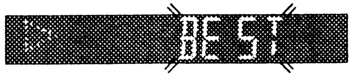
*2) Press **PLAY** when you are ready to start recording.*
  - *If you want to bypass the B.E.S.T. system and begin recording immediately, set "B.E.S.T." to "OFF" in step **4** on page 20.*

Playback

The recorder assesses the quality of the tape once you initiate playback.

1 START PLAYBACK

Press **PLAY**.

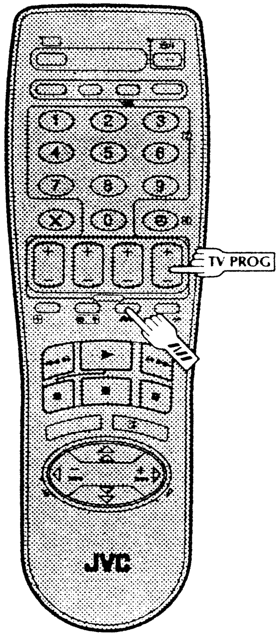


- The recorder adjusts the playback picture quality based on the quality of the tape in use.
- B.E.S.T. is active during Auto Tracking. "BEST" appears blinking on the recorder's display panel.

NOTES:

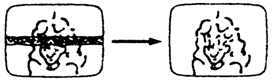
- *When watching a tape recorded with "B.E.S.T." set to "ON", it is recommended that you leave B.E.S.T. on during playback as well.*
- *When watching a rental tape or one recorded on another video recorder, or when using this recorder as the player for editing, set B.E.S.T. to your preference by performing steps **1** through **5** on page 20.*
- *"BEST" only appears at the beginning of automatic tracking. Even though it doesn't appear after that, the B.E.S.T. function is operative.*

Playback Picture Adjustment



Manual Tracking

Your video recorder is equipped with automatic tracking control. For most tapes this will automatically adjust the tracking to suit the particular tape you are playing. In some circumstances it may be necessary to make manual tracking adjustments. This is usually only associated with old or worn tapes or recordings made on old or worn recorders. If the automatic tracking control fails to operate correctly you will see noise bars across the picture as shown on the left below. To correct this you can override the automatic control and adjust the tracking manually by pressing the **TV PROG** buttons.



1

OVERRIDE AUTOMATIC TRACKING

Press /II on the remote to engage manual tracking.

2

ADJUST TRACKING MANUALLY

Press **TV PROG** + or – to adjust tracking.

3

RETURN TO AUTOMATIC TRACKING

Press /II on the remote to re-engage automatic tracking.

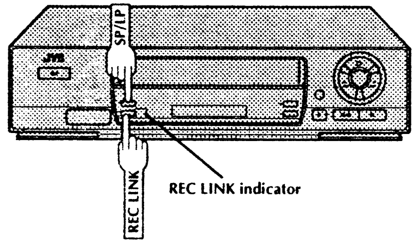
NOTE:

When a new tape is inserted, the recorder returns to the automatic tracking mode automatically.

Automatic Satellite Programme Recording

This facility allows you to record automatically a satellite programme which is timer-programmed on your external satellite receiver. Connect a satellite receiver to the recorder's AV2 IN connector and programme the timer on the satellite receiver; the recorder starts recording when the signals input from the satellite receiver to the AV2 IN connector, and when there is no input signals the recorder stops recording and the power shuts off.

Before performing the following steps:
- Make sure the satellite receiver is connected to the recorder's AV2 IN connector. (☞ pg. 29)
- Programme the timer on the satellite receiver.
- Insert a cassette with the safety tab in place.



ATTENTION
- Be sure not to turn on the satellite receiver before the programme is executed; otherwise, the recorder will start recording when the satellite receiver's power is turned on.
- If you have connected another appliance other than a satellite receiver to the AV2 IN connector, be sure not to engage the Auto Satellite Prog Rec mode; otherwise, the recorder will start recording when the connected appliance's power is turned on.
- Auto Satellite Prog recording and timer-recording cannot be done at the same time.

1

SET TAPE SPEED

Press **SP/LP** (/II) to set the tape speed.

2

ENGAGE AUTO SATELLITE PROG REC MODE

Press and hold **REC LINK** for about 2 seconds. The REC LINK indicator lights up and the recorder turns off automatically.

- To disengage the Auto Satellite Prog Rec mode, press **REC LINK**. The REC LINK indicator goes off.
- If the recorder's power is off, it is not possible to engage the Auto Satellite Prog Rec mode.

NOTES:
- *Auto Satellite Prog recording is not possible with the AV1 IN/OUT connector.*
- *When the Auto Satellite Prog Rec mode is engaged or the recorder's power is turned off after Auto Satellite Prog recording is finished, the recorder will not enter the Timer mode even though "AUTO TIMER" is set to "ON".*
- *After Auto Satellite Programme recording, the number of recorded programmes will not be displayed on the front display panel for the Instant ReView function (☞ pg. 19).*
- *For timer programming of the satellite receiver, refer to the instruction manual of the satellite receiver.*
- *Auto Satellite Prog recording is not possible if your satellite receiver does not have a timer.*
- *The REC LINK indicator blinks while Auto Satellite Prog recording is in progress.*
- *Pressing the recorder's ⏻/I button while Auto Satellite Prog recording is in progress turns off the recorder's power and disengages the Auto Satellite Prog Rec mode.*
- *If there is more than one satellite programme you wish to record with Auto Satellite Prog Recording, it is not possible to set a different tape speed for each; the tape speed selected in step 1 will apply to all the programmes for Auto Satellite Prog recording.*
- *The B.E.S.T. system (☞ pg. 20) does not work while Auto Satellite Prog recording is in progress.*
- *Just Clock (☞ pg. 37) does not work when the Auto Satellite Prog Rec mode is engaged.*
- *Depending on the type of satellite receiver, the recorder may not record a short portion at the beginning of the programme or may record slightly longer than the actual length of the programme.*
- *If you engage the Auto Satellite Prog Recording mode when the satellite receiver's power is on, the recorder will not start Auto Satellite Prog recording even though the REC LINK indicator blinks. When the satellite receiver shuts off once and is turned back on again, the recorder starts recording.*
- *You can also record a programme from your cable system in the same way if the system has a timer and is connected to the recorder's AV2 IN connector.*

Edit To Or From Another Video Recorder

You can use your video recorder as the source player or as the recording deck.

1 MAKE CONNECTIONS

Connect the player's 21-pin SCART connector to the recorder's 21-pin SCART connector as illustrated on the below.

When Using Your Video Recorder As The Source Player . . .

. . . connect its AV1 IN/OUT connector to the recording deck.

When Using Your Video Recorder As The Recording Deck . . .

. . . connect its AV2 IN or AV1 IN/OUT connector to the source player.

2 SET RECORDING DECK'S INPUT MODE

Set to AUX. With this video recorder, press **NUMBER** key "0" and/or **TV PROG** to select "L-1" for the AV1 IN/OUT connector, or "L-2" for the AV2 IN connector, depending on the connector being used.

3 START SOURCE PLAYER

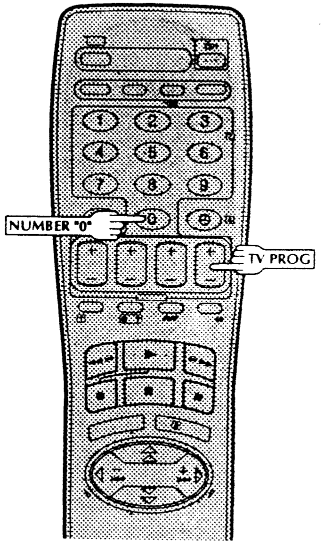
Engage its Play mode.

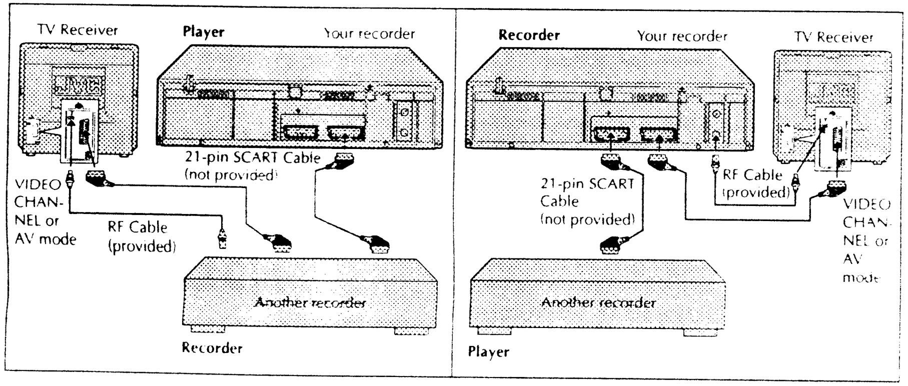
4 START RECORDING DECK

Engage its Record mode.

NOTES:

- *All necessary cables can be obtained from your dealer.*
- *When you use this recorder as the player for editing, be sure to set "O.S.D." to "OFF" before starting (☞ pg. 26).*


NUMBER "0"
TV PROG


TV Receiver
Player
Your recorder
21-pin SCART Cable (not provided)
VIDEO CHAN-NEL or AV mode
RF Cable (provided)
Another recorder
Recorder
Recorder
Your recorder
TV Receiver
21-pin SCART Cable (not provided)
RF Cable (provided)
VIDEO CHAN-NEL or AV mode
Another recorder
Player

Edit From A Camcorder

You can use a camcorder as the source player and your video recorder as the recorder.

1 MAKE CONNECTIONS

Connect the camcorder's AUDIO/VIDEO OUT connectors to the recorder's rear panel AV2 IN or AV1 IN/OUT connector via the optional cable adapter.

2 SET RECORDER'S INPUT MODE

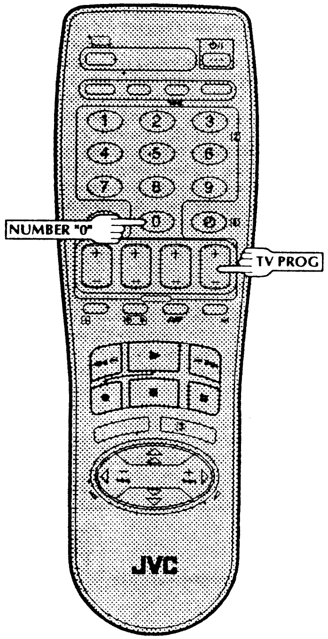
Press the **NUMBER** key "0" and/or **TV PROG** to select the appropriate input mode depending on the connector being used; "L-1" for the AV1 IN/OUT connector, or "L-2" for the AV2 IN connector.

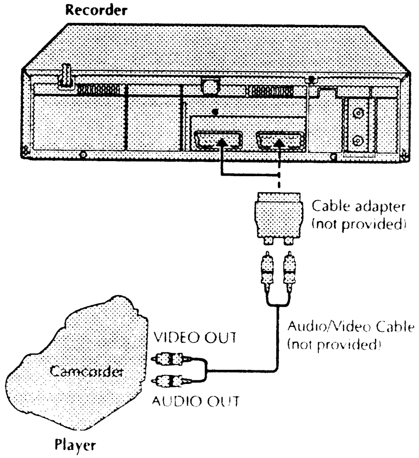
3 START CAMCORDER

Engage its Play mode.

4 START RECORDER

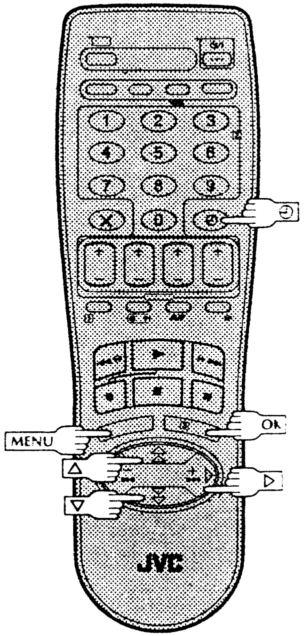
Engage its Record mode.


NUMBER "0"
TV PROG
JVC


Recorder
Cable adapter (not provided)
Audio/Video Cable (not provided)
VIDEO OUT
AUDIO OUT
Camcorder
Player

Other Functions

Turn on the TV and select the VIDEO channel (or AV mode).



On-Screen Display

You can choose whether or not to have various operational indicators appear on screen, by setting this function ON or OFF.

1 ACCESS MAIN MENU SCREEN

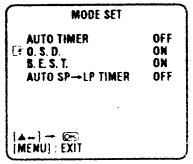
Press **MENU**.

2 ACCESS MODE SET SCREEN

Place the pointer next to "MODE SET" by pressing △▽, then press **OK** or ▷.

3 ENABLE/DISABLE ON-SCREEN DISPLAY

The default setting is "ON", so if you want on-screen displays, leave the setting as it is and go to step **4**. If you don't want the displays to appear, press △▽ to place the pointer next to "O.S.D." and press **OK** or ▷ to set "O.S.D." to "OFF".



```
           MODE SET

   AUTO TIMER              OFF
☞ O. S. D.                 ON
   B. E. S. T.             ON
   AUTO SP→LP TIMER        OFF



[▲▼] → OK
[MENU] : EXIT
```

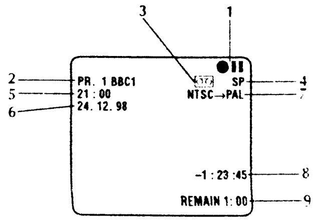
4 RETURN TO NORMAL

Press **MENU**.

NOTES:

- *When you use this recorder as the player for editing, be sure to set "O.S.D." to "OFF" before starting.*
- *During playback, the operation mode indicators may sometimes be disturbed depending on the type of tape being used.*

The superimposed indication on the TV screen tells you what the recorder is doing.

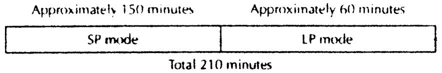


1– Operation mode indicators
2– Preset position number and station name/Aux. indicator (L-1 or L-2)
3– Cassette loaded mark
4– Tape speed SP/LP/EP (EP is for NTSC playback only)
5– Clock display
6– Current day/month/year
7– NTSC playback display (☞ pg. 28)
8– Counter display
9– Tape remaining time indicator (☞ pg. 13)

Auto SP→LP Timer

If, when timer-recording in SP mode, there is not enough tape to record the entire programme, the recorder automatically switches to LP mode to allow complete recording.

For Example . . .
Recording a programme of 210 minutes in length onto a 180-minute tape



Make sure you set "AUTO SP→LP TIMER" to "ON" at the Mode Set screen before the timer-recording starts.

1 ACCESS MAIN MENU SCREEN

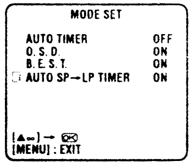
Press **MENU**.

2 ACCESS MODE SET SCREEN

Press △▽ to place the pointer next to "MODE SET", then press **OK** or ▷.

3 SELECT MODE

Press △▽ to place the pointer next to "AUTO SP→LP TIMER", then press **OK** or ▷ to select "ON".



```
           MODE SET

   AUTO TIMER              OFF
   O. S. D.                ON
   B. E. S. T.             ON
☞ AUTO SP→LP TIMER        ON



[▲▼] → OK
[MENU] : EXIT
```

4 RETURN TO NORMAL SCREEN

Press **MENU**.

NOTES:

- *The Auto SP→LP Timer feature is not available during ITR (Instant Timer Recording), and the feature will not work properly with any tapes longer than E-180 or with some tapes of shorter lengths.*
- *If you have programmed the recorder to timer-record 2 or more programs, the second programme and those thereafter may not fit on the tape if you set "AUTO SP→LP TIMER" to "ON". In this case, make sure the mode is not engaged, then set the tape speed manually during timer programming.*
- *In order to ensure that the recording fits on the tape, this feature may leave a short non-recorded section at the end of the tape.*
- *There may be some picture noise and sound disturbance at the point on the tape where the recorder switches from SP to LP mode.*
- *If you perform timer recording with both PDC and the Auto SP→LP Timer activated, and the programme goes beyond its originally scheduled length, there may be times when the programme cannot be recorded in its entirety.*

Auto Timer

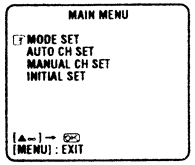
When the Auto Timer is set to ON the timer is automatically engaged when the recorder power is turned off and automatically disengaged when the recorder is powered back on.

1 ACCESS MAIN MENU SCREEN

Press **MENU**.

2 ACCESS MODE SET SCREEN

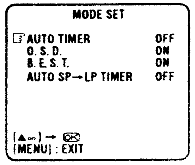
Press △▽ to place the pointer next to "MODE SET", then press **OK** or ▷.



```
        MAIN MENU

☞ MODE SET
   AUTO CH SET
   MANUAL CH SET
   INITIAL SET



[▲▼] → OK
[MENU] : EXIT
```

3 SELECT MODE

Press **OK** or ▷ to select either "ON" or "OFF".



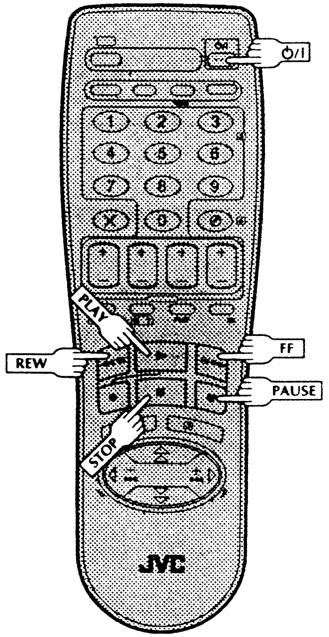
```
           MODE SET

☞ AUTO TIMER              OFF
   O. S. D.                ON
   B. E. S. T.             ON
   AUTO SP→LP TIMER        OFF



[▲▼] → OK
[MENU] : EXIT
```

4 RETURN TO NORMAL SCREEN

Press **MENU**.

NOTE:

For safety, when Auto timer is set to "OFF", all other recorder functions are disabled while the Timer mode is engaged. To disengage the timer, press ⏲.

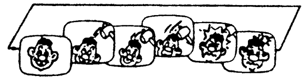

⏻/I
REW
FF
PAUSE
PLAY
STOP
JVC

Next Function Memory

You can set your recorder's power to go off automatically after the tape is fully rewound. Before starting, make sure the recorder is in the Stop mode.
For Automatic Power Off After Tape Rewind . . .
. . . press **REW**, then press ⏻/I within 2 seconds.

Repeat Playback

Your video recorder can automatically play back the whole tape 50 times repeatedly.



1 START PLAYBACK

Press **PLAY**.

2 ACTIVATE REPEAT PLAYBACK

Press **PLAY** and hold for over 5 seconds, then release.

- The Play indicator (▷) on the display panel blinks slowly.
- The tape plays 50 times automatically, and then stops.

3 STOP PLAYBACK

Press **STOP** at any time to stop playback.

NOTE:

*Pressing **PLAY**, **REW**, **FF** or **PAUSE** also stops Repeat Playback.*

NTSC Playback

Your video recorder is equipped with NTSC circuitry that can play back NTSC tapes.

1 LOAD A CASSETTE

Insert a cassette recorded in NTSC.

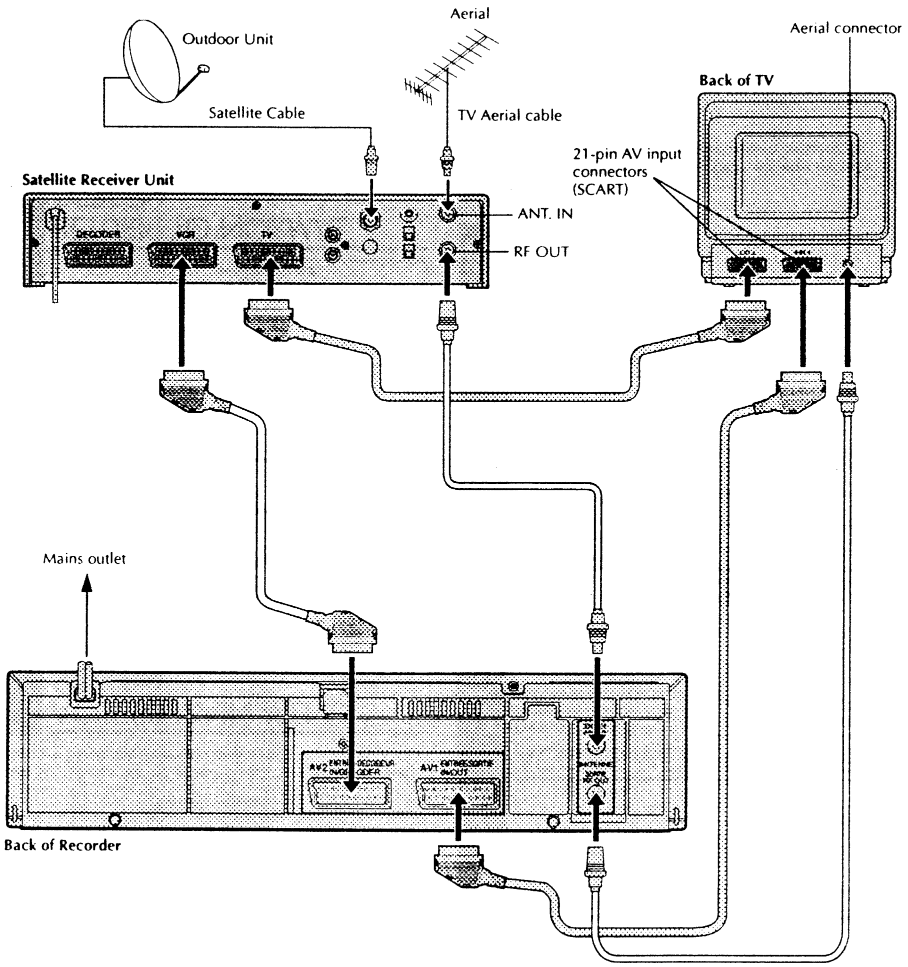
2 START PLAYBACK

Press **PLAY**.

- "NTSC→PAL" appears on the screen for about 5 seconds.
- Some TVs shrink the picture vertically and place black bars at the top and bottom of the screen. This is not a malfunction on the part of either the video recorder or the TV.
- The picture may roll up and down. This can be corrected using the V-HOLD control found on some TVs. (This cannot be corrected if the TV does not have a V-HOLD control.)
- The counter and tape remaining time readings will be incorrect.
- During search, still, or frame-by-frame playback, the picture will be distorted, and there may be a loss of colour.
- Depending on the type of TV, the top and bottom portions of superimposed displays may be cut off during NTSC playback.

Connection To A Satellite Receiver

The AV2 IN connector on the rear panel of your recorder allows simple connection to a satellite receiver.

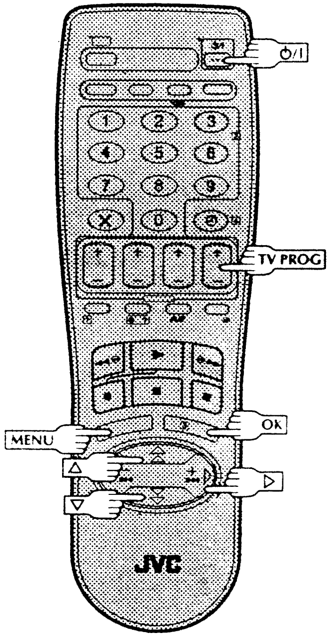

Outdoor Unit
Aerial
Aerial connector
Back of TV
Satellite Cable
TV Aerial cable
21-pin AV input connectors (SCART)
Satellite Receiver Unit
ANT. IN
RF OUT
Mains outlet
Back of Recorder
AV2
AV1

NOTES:

- *When connecting your recorder to a TV equipped with 21-pin AV input connectors (SCART), follow the illustration above using the cables shown in grey.*
- *For details, check your satellite receiver's instruction manual.*

Tuner Set

Turn on the TV and select the VIDEO channel (or AV mode).



IMPORTANT
Perform the following steps only if —
— Auto Channel Set has not been set correctly by Auto Set Up function (☞ pg. 8).
— you have moved to a different area or if a new station starts broadcasting in your area.

Your recorder needs to memorise all necessary stations in preset positions in order to record TV programmes. Auto Channel Set automatically assigns all receivable stations in your area to call them up by using the **TV PROG** buttons without going through any vacant channel.

Auto Channel Set

1 TURN ON THE RECORDER

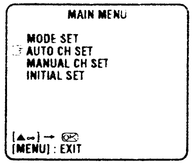
Press ⏻/I.

2 ACCESS MAIN MENU SCREEN

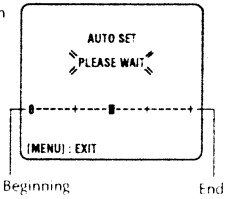
Press **MENU**.

3 PERFORM AUTO CHANNEL SET

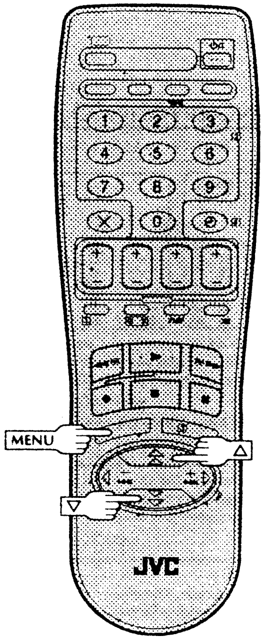
Place the pointer next to "AUTO CH SET" by pressing △▽, then press **OK** or ▷.



- The Auto Set screen appears, and remains on screen while the recorder searches for receivable stations. As Auto Channel Set progresses, the "▮" mark on the screen moves from left to right.

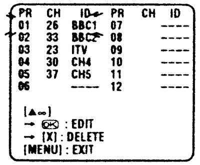


  Wait until the screen as shown in step **4** appears.
- Auto Channel Set usually takes about 4 - 12 minutes; the duration varies by area.



4 VIEW CONFIRMATION SCREEN

After "SCAN COMPLETED" is displayed on the screen for about 5 seconds, a Confirmation screen looking like the one on the right appears. The stations your recorder located appear on a Confirmation screen — preset positions (PR), channels (CH) and station names (ID – ☞ pg. 35). The blueback screen and the program currently being broadcast by the station which is blinking appear alternately for 8 seconds each.
To view the next page, use the △▽ button on the remote control.



PR	CH	ID	PR	CH	ID
01	26	BBC1	07		----
02	33	BBC2	08		----
03	23	ITV	09		----
04	30	CH4	10		----
05	37	CH5	11		----
06		----	12		----

[▲∞]
→ OK : EDIT
→ [X] : DELETE
[MENU] : EXIT

- The Guide Program numbers will also be set automatically during Auto channel Set.

5 RETURN TO NORMAL SCREEN

Press **MENU**.

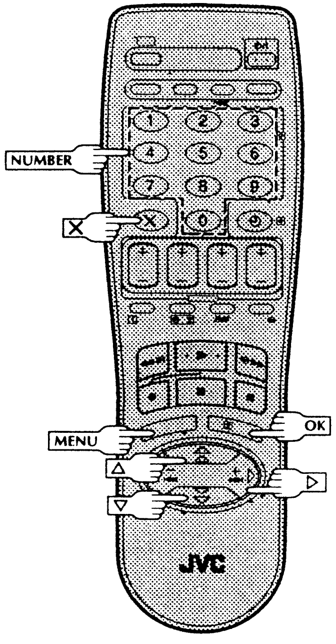
- Using the Confirmation screen, you can skip or add preset positions, enter station names and perform other operations. Refer to pages 32 - 34 for the procedures.
- Depending on reception conditions, the stations may, on occasion, not be stored in order, and the station names may not be stored correctly.

IMPORTANT

- In certain reception conditions, station names may not be stored correctly, and auto Guide Program Number Set may not work properly. If the Guide Program numbers are not set properly, when you timer-record a TV programme using Video Plus+, the recorder will record a TV programme of a different station. When programming the timer using Video Plus+, be sure to check that the preset position corresponding to the broadcasting station you wish to record has been selected (☞ pg. 14, "Video Plus+ Timer Programming").
- Your video recorder memorizes all detected stations even if reception of some of them is poor. In these cases picture quality may be poor. To delete those stations which have an unacceptable picture ☞ "Delete A Channel" on page 33.

NOTES:

- *Fine tuning is performed automatically during Auto Channel Set. If you wish to perform it manually, refer to page 33.*
- *If, for any reason, you perform Auto Channel Set when the aerial cable is not connected properly, "SCAN COMPLETED - NO SIGNAL-" appears on the screen in step* **4**. *When this happens, make sure of the aerial connection and press* **OK**: *Auto Channel Set will take place again.*



ATTENTION
After you have stored channels manually, be sure to perform Guide Program Number Set (☞ pg. 38) in order to get proper results from Video Plus+ timer recording.

Storing Channels Manually

To store channels that were not stored during Auto Set Up (☞ pg. 8) or Auto Channel Set (☞ pg. 30).

1 ACCESS MAIN MENU

Press **MENU**.

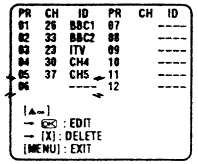
2 ACCESS CONFIRMATION SCREEN

Press △▽ to place the pointer next to "MANUAL CH SET", then press **OK** or ▷. The Confirmation screen appears.

3 SELECT POSITION

Press △▽ until an open position in which you want to store a channel begins blinking, then press **OK**. The Manual Channel Set screen appears.

(Ex.) To store in position 6.



```
PR  CH  ID    PR  CH  ID
01  26  BBC1  07      ----
02  33  BBC2  08      ----
03  23  ITV   09      ----
04  30  CH4   10      ----
05  37  CH5   11      ----
06      ----  12      ----

[▲∞]
→ OK : EDIT
→ [X] : DELETE
[MENU] : EXIT
```

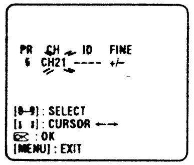
The blueback screen and the programme currently being broadcast by the selected channel appear alternately for 8 seconds each.

4 INPUT CHANNEL

Press the **NUMBER** keys to input the channel number you want to store.

For HR-J255ES Owners:
First press △▽ to select the band, either CH(regular) or CC(cable), and press ▷, then input the channel number.

- Input "0" before any single number entries.
- To input the registered station name (ID – ☞ pg. 35), press ▷ until "----" (ID setting) begins blinking, then press △▽.
- For fine tuning adjustment, press ▷ until "+/–" begins blinking, then press △▽. While tuning "+" or "–" appears.



```
PR  CH    ID    FINE
6   CH21  ----  +/-

[0–9] : SELECT
[‹ ›] : CURSOR ←→
OK : OK
[MENU] : EXIT
```

The blueback screen and the programme currently being broadcast by the selected channel appear alternately for 8 seconds each.

5 ENTER NEW CHANNEL INFORMATION

Press **OK** and the Confirmation screen appears.

- Repeat steps **3** through **5** as necessary.

6 CLOSE CONFIRMATION SCREEN

Press **MENU**.

- To change positions, see "Change Station Preset Position" (☞ pg. 33)
- If you wish to set station names other than the ones registered in your recorder, ☞ "Set Stations (B)" on page 34.

Delete A Channel

Perform steps **1** and **2** of "Storing Channels Manually" on page 32 to access the Confirmation screen before continuing.

1 SELECT ITEM

Press △▽ until the item you want to delete begins blinking.

2 DELETE CHANNEL

Press **X**.

- The item directly beneath the cancelled one moves up one line.
- Repeat steps **1** and **2** as necessary.

3 CLOSE CONFIRMATION SCREEN

Press **MENU**.

Change Station Preset Position

Perform steps **1** and **2** of "Storing Channels Manually" on page 32 to access the Confirmation screen before continuing.

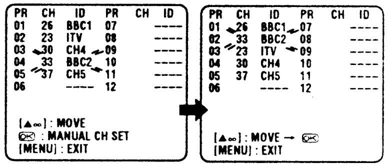
1 SELECT ITEM

Press △▽ until the item you want to move begins blinking. Then press **OK** and the station name (ID) and its channel (CH) number begin blinking.

2 SELECT NEW POSITION

Press △▽ to move the station to the new preset position, then press **OK**.

Example: If you moved the station in position 4 to position 2, the stations originally in positions 2 and 3 each move down one space.



```
PR  CH  ID    PR  CH  ID
01  26  BBC1  07      ----
02  23  ITV   08      ----
03  30  CH4   09      ----
04  33  BBC2  10      ----
05  37  CH5   11      ----
06      ----  12      ----

[▲∞] : MOVE
OK : MANUAL CH SET
[MENU] : EXIT
```

```
PR  CH  ID    PR  CH  ID
01  26  BBC1  07      ----
02  33  BBC2  08      ----
03  23  ITV   09      ----
04  30  CH4   10      ----
05  37  CH5   11      ----
06      ----  12      ----

[▲∞] : MOVE → OK
[MENU] : EXIT
```

- Repeat steps **1** and **2** as necessary.

3 CLOSE CONFIRMATION SCREEN

Press **MENU**.

Fine-Tuning Channels Already Stored

Perform steps **1** and **2** of "Storing Channels Manually" on page 32 to access the Confirmation screen before continuing.

1 SELECT CHANNEL TO FINE-TUNE

Press △▽ until the channel you want to tune begins blinking.

2 ACCESS MANUAL CHANNEL SET SCREEN

Press **OK** twice. The Manual Channel Set screen appears.

3 PERFORM TUNING

Press ▷ until "+/-" begins blinking, then press △▽ until the picture is clearest. Then press **OK**.

- The Confirmation screen appears.
- Repeat steps **1** through **3** as necessary.

4 CLOSE CONFIRMATION SCREEN

Press **MENU**.

ATTENTION
After you have deleted channels or changed preset positions, be sure to perform Guide Program Number Set (☞ pg. 38) in order to get proper results from Video Plus+ timer recording.

Set Stations (A)

Set station names that are registered in your recorder.

Perform steps **1** and **2** of "Storing Channels Manually" on page 32 to access the Confirmation screen before continuing.

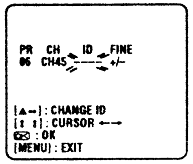
1 SELECT ITEM

Press △▽ until the item you want begins blinking.

2 ACCESS MANUAL CHANNEL SET SCREEN

Press **OK** twice.

3 SELECT NEW STATION



Press ▷ until the station name (ID) begins blinking, then press △▽ until the new station's name (ID) you want to store begins blinking.
Registered station names (☞ pg. 35) appear as you press △▽.

4 SWITCH STATIONS

Press **OK**.

- The Confirmation screen appears.
- Repeat steps **1** through **4** as necessary.

5 CLOSE CONFIRMATION SCREEN

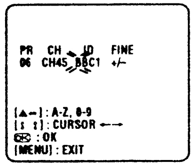
Press **MENU**.

Set Stations (B)

Set station names other than the ones registered in your recorder.

Perform steps **1** and **2** of "Storing Channels Manually" on page 32 to access the Confirmation screen and then perform step **1** and **2** of "Set Stations (A)" on the left before continuing.

1 SELECT STATION NAME CHARACTER



Press ▷ until the first letter of the station name begins blinking.

2 ENTER NEW CHARACTER

Press △▽ to cycle through the characters (A–Z, 0–9, –, ✱, +, — (space)) and stop when the desired character is indicated, then press ▷ to enter. Enter the remaining characters the same way (maximum of 4).
After entering all characters, press **OK**.

- The Confirmation screen appears.
- If you make a mistake, press ◁ until the incorrect character begins blinking. Then enter the correct character by pressing △▽.

3 CLOSE CONFIRMATION SCREEN

Press **MENU**.

TV Station And ID List

STATION NAME	ID*
Anglia TV	ANGL
ARD	ARD
ARTE	ARTE
BBC Group	BBC
BBC1	BBC1
BBC2	BBC2
Berlin 1	BLN1
Berlin 2	BLN2
Border TV	BORD
Bayern1	BR1
Bayern3	BR3
BRT1	BRT1
BRT2	BRT2
Children Ch	CHLD
Canal +	CH+
CNN	CNN
Channel TV	CHNL
Central TV	CNTR
Channel 4	CH 4
Channel 5	CH 5
DRS	DRS
DR TV	DRTV
DSF	DSF
Euronews	EURN
Euronews	EURO
Eurosports	EURS
France1	FR1
France2	FR2
France3	FR3
Granada TV	GRNA
Grampian TV	GRMP
Hessen1	HR1
Hessen3	HR3
HRT	HRT
HTV	HTV
ITV Network	ITV
Kabelkanal	KABL
London	LNDN
MDR	MDR
MTV	MTV
Nord3	N3
NDR1	NDR1
NDR3	NDR3
NED1	NED1
NED2	NED2
NED3	NED3
Network 2	NET2
NRK	NRK
N-TV	N-TV
Ottener Kanal	OKAN
ORF1	ORF1
ORF2	ORF2
ORF3	ORF3
OWL 3	OWL3
Premiere	PRMI
PRO7	PRO7
RAI1	RAI1
RAI2	RAI2
RAI3	RAI3
RB1	RB1
RB3	RB3
Rikisutvarpid-S	RKPS
RTBF 1	RTB1
RTBF 2	RTB2
RTE 1	RTE1
RTL	RTL
RTL 2	RTL2
RTP	RTP

STATION NAME	ID*
SAT	SAT
SAT 1	SAT1
Scottish TV	SCOT
SC4	SC4
SDR	SDR
SDR1	SDR1
SFB1	SFB1
SFB3	SFB3
SKY	SKY
Sky One	SKY1
Sky Net	SKYN
Sport	SPRT
SR 1	SR1
Super RTL	SRTL
STV Test	STVT
STV 1	STV1
STV 2	STV2
Suedwest3	SW3
SWF 1	SWF1
Schweiz4	SWZ4
TYNE TEES	TEES
Text	TEXT
TF1	TF1
TNT int	TNT
TRT int	TRT
TSI	TSI
TSR	TSR
TSW	TSW
TVE	TVE
TV Polonia	TVPA
TVP 1	TVP1
TVP 2	TVP2
TVS	TVS
TV2	TV2
TV5	TV5
Tele Zurich	TZUR
Ulster TV	ULST
Veronica	VERN
VIVA	VIVA
VIVA2	VIV2
VOX	VOX
VTM	VTM
VT4	VT4
West1	WDR1
West3	WDR3
YLE 1	YLE1
YLE 2	YLE2
Yorkshire TV	YORK
ZDF	ZDF
Zurich 1	ZUR1
3SAT	3SAT

* The "ID" abbreviation is what is shown on-screen in lieu of the station name. The "ID" abbreviation is listed in the Confirmation screen and is displayed on the TV screen each time the recorder is tuned to a different station.

TV Station Channel Number Guide

For customers in the U.K.

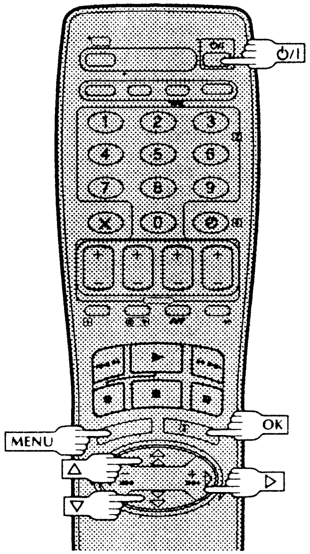
Only the main stations are listed. There are in addition many relay stations, and full lists are available from the BBC and ITV.

	BBC1	BBC2	ITV	CH4	CH5
London & South-East					
Bluebell Hill	40	46	43	65	—
Crystal Palace	26	33	23	30	37
Dover	50	56	66	53	—
Heathfield	49	52	64	67	—
Oxford	57	63	60	53	49
South-West					
Beacon Hill	57	63	60	53	—
Caradon Hill	22	28	25	32	—
Huntshaw Cross	55	62	59	65	67
Redruth	51	44	41	47	37
Stockland Hill	33	26	23	29	—
Channel Islands Fremont Point	51	44	41	47	—
South					
Hannington	39	45	42	66	35
Midhurst	61	55	58	68	—
Rowridge	31	24	27	21	—
West					
Mendip	58	64	61	54	37
East					
Sandy Heath	31	27	24	21	39
Sudbury	51	44	41	47	35
Tacolneston	62	55	59	65	52
Midlands					
Ridge Hill	22	28	25	32	35
Sutton Coldfield	46	40	43	50	37
The Wrekin	26	33	23	29	35
Waltham	58	64	61	54	35
North					
Belmont	22	28	25	32	56
Emley Moor	44	51	47	41	37

	BBC1	BBC2	ITV	CH4	CH5
North-West					
Caldbeck	30	34	28	32	56
Winter Hill	55	62	59	65	48
North-East					
Bilsdale West Moor	33	26	29	23	35
Chatton	39	45	49	42	—
Pontop Pike	58	64	61	54	68
Scotland					
Angus	57	63	60	53	—
Black Hill	40	46	43	50	37
Sandale	22	—	—	—	—
Caldbeck	—	34	28	32	56
Creigkelly	31	27	24	21	48
Darvel	33	26	23	29	35
Durris	22	28	25	32	67
Eitshal	33	26	23	29	—
Keelylang Hill	40	46	43	50	—
Knock More	33	26	23	29	—
Rosemarkie	39	45	49	42	67
Rumster Forest	31	27	24	21	—
Selkirk	55	62	59	65	52
Wales					
Blaenplwyf	31	27	24	21	56
Carmel	57	63	60	53	—
Llanddona	57	63	60	53	—
Moel-y-Parc	52	45	49	42	—
Presely	46	40	43	50	37
Wenvoe	44	51	41	47	—
Northern Ireland					
Brougher Mountain	22	28	25	32	—
Divis	31	27	24	21	37
Limavady	55	62	59	65	—

Clock Set

Turn on the TV and select the VIDEO channel (or AV mode).



Just Clock
The Just Clock function provides accurate time keeping through automatic adjustments at regular intervals, by reading data from a PDC signal.
The Just Clock option can be set "ON" or "OFF" at the Clock Set screen (the default setting is "ON"). Press **OK** until the Just Clock setting begins blinking, then press △▽ to change the setting.

IMPORTANT: If you turn the Just Clock function off, the accuracy of your recorder's built-in clock may be impaired, which could adversely affect timer recording.

NOTES:

- *Just Clock (when set to "ON") adjusts the recorder's built-in clock every hour, except for 23:00, 0:00, 1:00 and 2:00.*
- *Just Clock is not effective when . . .*
  - *the recorder's power is on.*
  - *the recorder is in the Timer mode.*
  - *a difference of more than 3 minutes exists between the built-in clock's time and the actual time.*
  - *the recorder is in the Auto Satellite Prog Rec mode (☞ pg. 23).*
- *If Just Clock is set to "ON", the recorder's clock is automatically adjusted at the start/end of Summer Time.*
- *Just Clock may not function properly in poor reception conditions.*

IMPORTANT
If you performed Auto Set Up (☞ pg. 8) or Auto Channel Set (☞ pg. 30), without ever having set the clock previously, the recorder's built-in clock is also set automatically.
Perform the following steps only if —
— Auto Clock Set has not been performed correctly by Auto Set Up or Auto Channel Set.
or
— the recorder's memory backup has expired.
or
— you want to change Just Clock setting (☞ "Just Clock" in the left column).

1 TURN THE RECORDER ON

Press ⏻/I.

2 ACCESS MAIN MENU SCREEN

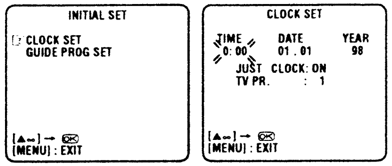
Press **MENU**.

3 ACCESS INITIAL SET SCREEN

Place the pointer next to "INITIAL SET" by pressing △▽, then press **OK** or ▷.

4 ACCESS CLOCK SET SCREEN

Place the pointer next to "CLOCK SET" by pressing △▽, then press **OK** or ▷. The Clock Set screen appears.



5 SET DATE AND TIME

Press △▽ to set the time, then press **OK** or ▷. The "date" display begins blinking. Repeat the same procedure to set the date and year.

- When you set the time, press and hold △▽ to change the time by 30 minutes.
- When you set the date, press and hold △▽ to change the date by 15 days.

6 SET JUST CLOCK

The default setting is "ON". Set as desired by pressing △▽, then press **OK** or ▷.

- For the Just clock function, ☞ "Just Clock" on the left.
- If you set to "OFF", you can disregard the next step as you won't be able to receive regular clock adjustments.

7 SET CLOCK DATA SOURCE PRESET

The recorder is preset to receive clock setting and adjustment data from preset position 1. Press △▽ to set the preset position to the number representing the station transmitting clock setting data (BBC1, BBC2, etc.), then press **OK** or ▷.

8 START CLOCK OPERATION

Press **MENU**.

Video Plus+ Setup

IMPORTANT

Normally, Auto Set Up (☞ pg. 8) or Auto Channel Set (☞ pg. 30) sets the Guide Program Numbers automatically. You need to set the Guide Program Numbers manually only in the following cases.

- *When timer-programming with Video Plus+, the preset position, where the station you wish to record is received on your recorder, is not selected.*

— Set the Guide Program Number for that station manually.

- *When you add/delete a channel or change preset positions manually after Auto Set Up or Auto Channel Set has taken place.*

— Set the Guide Program Numbers for all the receivable stations manually.

- *When you wish to timer-record a satellite programme with Video Plus+.*

— Set the Guide Program Numbers for all satellite broadcasts received on your satellite receiver.

Turn on the TV and select the VIDEO channel (or AV mode).

Guide Program Number Set

1 ACCESS MAIN MENU SCREEN

Press **MENU**.

2 ACCESS INITIAL SET SCREEN

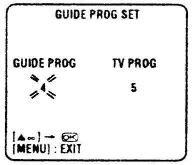
Press △▽ to place the pointer next to "INITIAL SET", then press **OK** or ▷.

3 ACCESS GUIDE PROG SET SCREEN

Press △▽ to place the pointer next to "GUIDE PROG SET", then press **OK** or ▷.

4 ENTER GUIDE PROG NUMBER

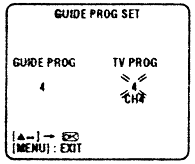
Press △▽ or **NUMBER** keys to enter the Guide Program number for the desired station as shown in the TV listings. Then press **OK** or ▷.



(Ex.) When inputting the Guide Program number 4 for CH4.

5 ENTER RECEIVING PRESET POSITION NUMBER

Press △▽ or **NUMBER** keys to input the number of the recorder's preset position on which the Guide Program number's broadcast is received. Then press **OK** or ▷.



(Ex.) If CH4 is received on preset position 4.

- If the satellite broadcast is received on your recorder's auxiliary channel "L-2", select "L-2" for the preset position.
- Repeat steps **4** and **5** as necessary.

6 RETURN TO NORMAL SCREEN

Press **MENU**.

Guide Program Number

"Guide Program (GUIDE PROG) number" refers to the assigned TV station numbers, according to broadcast area, for Video Plus+ timer recording. The Guide Program numbers can be found in most TV listings.

Questions And Answers

PLAYBACK

Q. What happens if the end of the tape is reached during playback or search?
A. The tape is automatically rewound to the beginning.

……

Q. Can the video recorder indefinitely remain in the still mode?
A. No. It stops automatically after 5 minutes to protect the heads.

……

Q. During search, slow, still and frame-by-frame playback, I can't hear any audio. What's the problem?
A. This is normal.

……

Q. When returning from multi-speed search to normal playback, the picture is disturbed. Should I be concerned about this?
A. No, it is normal.

……

Q. Noise bars appear during multi-speed search. What's the problem?
A. This is normal.

……

Q. Other than preventing further recording, what effect does removing the Record Safety tab have?
A. It disables marking of index codes.

……

Q. Sometimes, during Index Search, the video recorder can't find the programme I want to see. Why not?
A. There may be index codes too close together.

……

RECORDING

Q. When I pause and then resume a recording, the end of the recording before the pause is overlapped by the beginning of the continuation of recording. Why does this happen?
A. This is normal. It reduces distortion at the pause and resume points.

……

Q. Can the video recorder indefinitely remain in the Record-Pause mode?
A. No. The video recorder shuts off automatically after 5 minutes to protect the heads.

……

Q. What happens if the tape runs out during recording?
A. The video recorder automatically rewinds it to the beginning or, if Timer Recording, the cassette is ejected.

……

TIMER RECORDING

Q. "◯" and "⏲" remain lit on the display panel. Is there a problem?
A. No. This is a normal condition for a timer recording in progress.

……

Q. Can I program the timer while I'm watching a tape or a TV broadcast?
A. You won't see the picture as it is replaced by the on-screen menu, but the audio from the program or tape you're viewing can be heard.

……

Q. Is it possible to timer-record a TV programme broadcast in 2000?
A. Yes, it is possible.

……

ATTENTION:
This recorder contains microcomputers. External electronic noise or interference could cause malfunctioning. In such cases, switch the recorder off and unplug the mains power cord. Then plug it in again and turn the recorder on. Take out the cassette. After checking the cassette, operate the unit as usual.

Troubleshooting

Before requesting service for a problem, use this chart to see if you can correct the trouble yourself. Small problems are often easily corrected, and this can save you the trouble of sending your video recorder off for repair.

POWER

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. No power is applied to the recorder.	• The mains power cord is disconnected.	Connect the mains power cord.
2. The clock is functioning properly, but the recorder cannot be powered.	• "◷" is displayed on the display panel with Auto Timer set to "OFF".	Press the ◷ button to turn the "◷" indicator off.
3. The remote control won't function.	• The batteries are discharged.	Replace the dead batteries with new ones.

TAPE TRANSPORT

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. The tape does not run during recording.	• "⏸" is displayed on the display panel.	Press **PLAY** to turn the "⏸" indicator off.
2. The tape will not rewind or fast-forward.	• The tape is already fully rewound or fast-forwarded.	Check the cassette.

PLAYBACK

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. The playback picture does not appear while the tape is running.	• If you're using the RF OUT connection . . . . . . the TV receiver's channel selector is not set to the VIDEO channel. . . . the recorder's VIDEO channel has not been correctly set. • If you're using the AV connection, the TV receiver is not set to the AV mode.	If you are using the RF OUT connection . . . . . . set the TV receiver to the VIDEO channel. (☞ pg. 6) . . . Perform "Video Channel Set" (☞ pg. 6) If you are using the AV connection, set the TV to its AV mode.
2. Noise appears during visual search.	• This is normal.	
3. Noise appears during normal playback.	• The automatic tracking mode is engaged.	Try manual tracking (☞ pg. 22).
4. The playback picture is blurred or interrupted while TV broadcasts are clear.	• The video heads may be dirty.	Consult your JVC dealer.

RECORDING

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. Recording cannot be started.	• There is no cassette loaded, or the cassette loaded has had its Record Safety tab removed.	Insert a cassette or using adhesive tape, reseal the slot where the tab was removed.
2. TV broadcasts cannot be recorded.	• "L-1" or "L-2" has been selected as the input mode.	Set to the desired preset.
3. Tape-to-tape editing is not possible.	• The source (another video recorder, camcorder) has not been properly connected. • All necessary power switches have not been turned on • The input mode is not correct.	Confirm that the source is properly connected. Confirm that all units' power switches are turned on. Set the input mode to "L-1" or "L-2".
4. Camcorder recording is not possible.	• The camcorder has not been properly connected. • The input mode is not correct.	Confirm that the camcorder is properly connected. Set the input mode to "L-1" or "L-2".

TIMER RECORDING

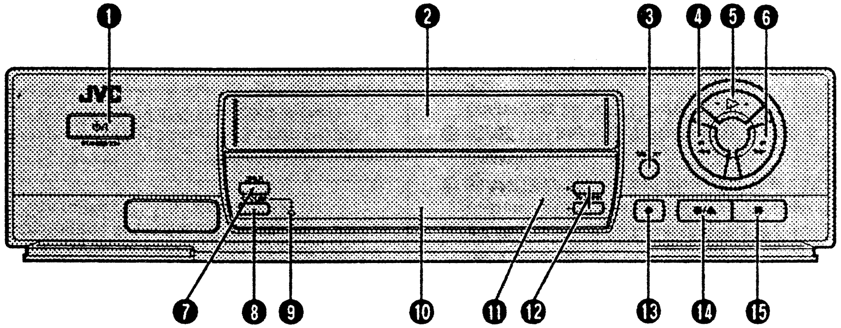
SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. Timer recording won't work.	• The clock and/or the timer have been set incorrectly. • The timer is not engaged.	Re-perform the clock and/or timer settings. Press ◷ and confirm that "◷" is displayed on the display panel.
2. Timer programming is not possible.	• Timer recording is in progress.	Timer programming can't be performed while a timer recording is in progress. Wait until it finishes.
3. "◷" and "🖭" on the display panel won't stop blinking.	• The timer is engaged but there's no cassette loaded.	Load a cassette with the Record Safety tab intact, or cover the hole using adhesive tape.
4. The cassette is automatically ejected, and "◷" and "🖭" on the display panel won't stop blinking.	• The loaded cassette has had its Record Safety tab removed.	Remove the cassette and cover the hole with adhesive tape, or insert a cassette with the Record Safety tab intact.
5. "◷" blinks for 10 seconds and the Timer mode is disengaged.	• ◷ has been pressed when there are no programs in memory, or the timer record information has been programmed incorrectly.	Check the programmed data and re-program as necessary, then press ◷ again.
6. The cassette is automatically ejected, the power shuts off and "◷" and "🖭" won't stop blinking.	• The end of the tape was reached during timer recording.	The programme may not have been recorded in its entirety. Next time make sure you have enough time on the tape to record the entire programme.
7. Video Plus+ does not timer-record properly.	• The recorder's preset positions have been set incorrectly.	Refer to "Guide Program Number Set" and re-perform the procedure (☞ pg. 38).

OTHER PROBLEMS

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. Whistling or howling is heard from the TV during camcorder recording.	• The camcorder's microphone is too close to the TV. • The TV's volume is too high.	Position the camcorder so its microphone is away from the TV. Turn the TV's volume down.
2. When scanning channels, some of them are skipped over.	• Those channels have been designated to be skipped.	If you need the skipped channels, restore them (☞ pg. 32).
3. The preset cannot be changed.	• Recording is in progress.	Press **PAUSE** to pause the recording, change presets, then press **PLAY** to resume recording.
4. Channel settings that were made manually seem to have changed or disappeared.	• After the manual settings were made, Auto Channel Set was performed.	Perform manual setting again.
5. No channels are stored in the recorder's memory.	• The TV aerial cable was not connected to the recorder when Auto Set Up was performed.	Connect the TV aerial cable to the recorder properly and turn off the recorder power once, then turn the recorder power back on again. The recorder will try Auto Set Up again (☞ pg. 8).

Index

FRONT VIEW



① **STANDBY/ON ⏻/I Button** turns recorder on/off (loading a cassette also turns power on).

② **Cassette Loading Slot** is where cassette is inserted; door closes, "cassette loaded" indicator lights up on front display panel.

③ **DISPLAY Button** switches display between clock time, tape remaining time, counter readings, preset position*. ☞ pg. 13

** Preset position is not displayed during playback.*

④ **Rewind [REW] Button** rewinds the tape ☞ pg. 10; initiates high-speed reverse search. ☞ pg. 11

⑤ **PLAY Button** plays back tape ☞ pg. 10; cancels Pause, Still, Slow, Search modes. ☞ pg. 11

⑥ **Fast Forward Button** fast-forwards tape ☞ pg. 10; initiates high-speed forward search. ☞ pg. 11

⑦ **SP/LP Button** selects tape speed. ☞ pg. 12

⑧ **REC LINK Button** enables/disables the Auto Satellite Prog Rec mode. ☞ pg. 23

⑨ **REC LINK Indicator** lights when the Auto Satellite Rec mode is engaged. ☞ pg. 23

⑩ **Display Panel** provides clear view of various displays and indicators. ☞ pg. 46

⑪ **Infrared Beam Receiving Window** is where remote control should be aimed when in use.

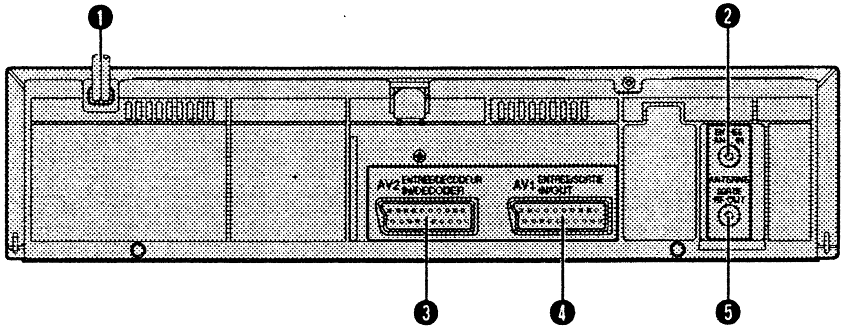
⑫ **TV PROG +/– Buttons** select a preset position. ☞ pg. 12

⑬ **RECORD Button** starts regular recording (press once), Instant Timer Recording (press twice); sets duration of ITR. ☞ pg. 12, 13

⑭ **STOP/EJECT Button** stops tape; ejects tape during Stop mode. ☞ pg. 10

⑮ **PAUSE Button** stops tape temporarily during recording ☞ pg. 12; stops tape temporarily during playback; plays back frame by frame with each additional press. ☞ pg. 11

REAR VIEW



① **Mains Power Cord** supplies power to recorder. ☞ pg. 5

② **ANT. IN Connector** enables connection of aerial. ☞ pg. 5

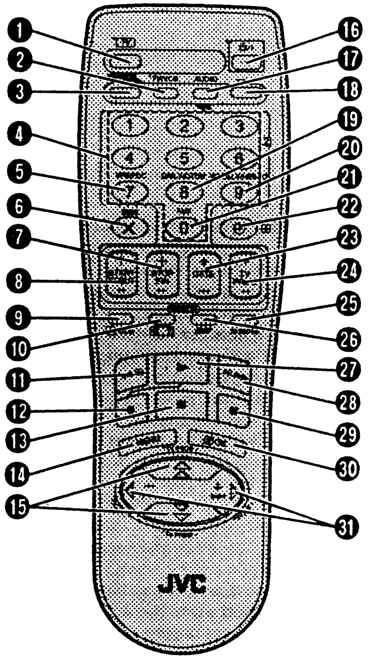
③ **AV2 IN Connector** enables connection of satellite receiver or second recorder; input recordable when "L-2" selected. ☞ pg. 24, 29

* DECODER connection is not available with this recorder.

④ **AV1 IN/OUT Connector** enables AV connection to TV or second recorder; input recordable when "L-1" selected. ☞ pg. 5, 24

⑤ **RF OUT Connector** enables connection to aerial terminal of TV receiver. ☞ pg. 5

REMOTE CONTROL



Buttons with a small dot on the left side of the name can also be used to operate your JVC TV while holding down the **TV** button.
☞ "Operating JVC TVs" on page 45.

This remote control transmits A code signals only; it is not applicable to B code signals.

① **TV Button** enables remote control of your JVC TV. ☞ "Operating JVC TVs" on page 45.

② **TV/VCR Button** switches connected TV's mode between TV and AV. ☞ "Operating JVC TVs" on page 45.

③ **REVIEW Button** "reviews" timer-recorded programme. ☞ pg. 19

④ **NUMBER Keys** are used in preset position selection ☞ pg. 12, Video Plus+ timer programming ☞ pg. 14.

⑤ **PDC Button** enables/disables PDC recording. ☞ pg. 15, 17

⑥ **X Button** cancels timer-programme. ☞ pg. 18
0000 Button resets counter to 0:00:00. ☞ pg. 13

⑦ **STOP +/– Button** inputs programme Stop Time. ☞ pg. 16

⑧ **START +/– Button** accesses Regular Program screen; inputs programme Start Time. ☞ pg. 16

⑨ **PROG Button** accesses Video Plus+ Program screen. ☞ pg. 14

⑩ **⊙ ? Button** accesses Program screens/displays to check the program that you have programmed (next program's information screen appears each time button is pressed). ☞ pg. 18

⑪ **Rewind [REW] Button** — same as button on recorder. ☞ pg. 10, 11

⑫ **Record Button** — same as button on recorder. ☞ pg. 12

⑬ **Stop Button** — same as button on recorder. ☞ pg. 10

⑭ **MENU Button** accesses Menu screen. ☞ pg. 20

⑮ **△▽ Button** is used for selection in on-screen menus. ☞ pg. 20
TV PROG +/– selects the connected JVC TV's channel. ☞ "Operating JVC TVs" on page 45.

⑯ **STANDBY/ON ⏻/I Button** — same as button on recorder.

⑰ **🔈/🔇 (TV Muting) Button** mutes sound of connected TV. ☞ "Operating JVC TVs" on page 45.

⑱ **DISPLAY Button** — same as button on recorder. ☞ pg. 13

⑲ **DAILY Button** enables timer recording of daily serials. ☞ pg. 15, 17

⑳ **WEEKLY Button** enables timer recording of weekly serials. ☞ pg. 15, 17

㉑ **AUX Button** selects recorder's auxiliary input mode. ☞ pg. 24

㉒ **⊙ Button** engages timer-standby mode. ☞ pg. 15, 17

㉓ **DATE +/– Button** inputs date of program for timer recording. ☞ pg. 16

㉔ **TV PROG +/– Button** — same as button on recorder. ☞ pg. 12

㉕ **30 SEC Button** initiates a 30-second period of fast-motion playback. ☞ pg. 19

㉖ **Auto Tracking Button** enables/disables auto tracking mode during playback ☞ pg. 22
SP/LP Button selects tape speed. ☞ pg. 12

㉗ **Play Button** — same as button on recorder. ☞ pg. 10, 11

㉘ **Fast Forward Button** — same as button on recorder. ☞ pg. 10, 11

㉙ **Pause Button** — same as button on recorder. ☞ pg. 11

㉚ **OK Button** enters selections made in on-screen menus. ☞ pg. 20

㉛ **◁ ▷ Button** initiates functions such as Index Search ☞ pg. 19, variable-speed search, frame by frame playback. ☞ pg. 11
TV ◢ +/–Button controls volume of connected TV. ☞ "Operating JVC TVs" in the right column.

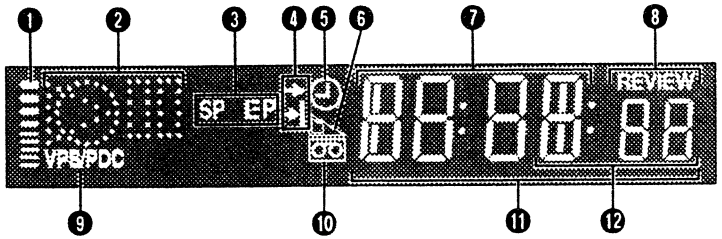
How To Use
The remote control can operate most of your video recorder's functions, as well as basic functions of JVC TV sets. (See below.)
- Point the remote control toward the sensor window.
- The maximum operating distance of the remote control is about 8 m.

Operating JVC TVs
To operate your TV, while holding down the **TV** button, press the corresponding button: **STANDBY/ON ⏻/I**, **TV/VCR**, **TV PROG +/–**, **TV ◢ +/–**, **🔈/🔇** (TV Muting).

NOTES:

- *When inserting the batteries, be sure to insert in the correct directions as indicated under the battery cover.*
- *Depending on the type of JVC TV, there may be cases where some or all functions cannot be operated using the remote control.*
- *If the remote control doesn't work properly, remove its batteries, wait a short time, replace the batteries and then try again.*

DISPLAY PANEL



❶ **B.E.S.T. Picture System Display** lights from bottom to top while B.E.S.T. is active. ☞ pg. 20

❷ **Symbolic Mode Indicators**

PLAY: FF/REW VARIABLE SHUTTLE SEARCH:	▷	STILL: SLOW:	▷▥
		RECORD:	○
		RECORD PAUSE:	○▥

❸ **Tape Speed Indicators** display mode of recording; light during Record or Play mode. ☞ pg. 12

** EP is only for NTSC playback.*

❹ **Programme Time Indicators** show the programme start time (⇥) and the programme stop time (⇥|) for timer-recording. ☞ pg. 16

❺ **"Timer" Indicator** lights when ⊕ has been pressed to engage Timer mode. ☞ pg. 15, 17

❻ **Tape Remaining Time Indicator** displays time remaining on tape when certain buttons are pressed. ☞ pg. 13

❼ **Channel Display** shows preset position where the station currently being received is stored. **Clock Display** shows current time. ☞ pg. 9

❽ **Instant REVIEW Indicator** blinks after timer-recording and shows how many programmes have been timer-recorded. ☞ pg. 19

❾ **PDC Indicator** lights when PDC has been engaged for timer recording. ☞ pg. 15, 17

** VPS (Video Programme System) recording is not possible with this recorder.*

❿ **"Cassette Loaded" Mark** lights once a cassette is inserted; remains lit until cassette ejected or power turned off.

⓫ **Counter** shows time elapsed since playback or recording began.

With ⊿ displayed, shows time remaining from current tape position to end of tape (☞ pg. 13).

Counter, Preset Position*, Clock and Tape Remaining Time Display appear alternately when **DISPLAY** (or – –:– –) is pressed.

** Preset Position is not displayed during playback.*

⓬ **Mode** shows external input mode selected (L–1 or L-2).

SPECIFICATIONS

GENERAL

Power requirement	: AC 220 – 240 V∿, 50/60 Hz
Power consumption	
Power on	: 20 W
Power off	: 5 W
Temperature	
Operating	: 5°C to 40°C
Storage	: –20°C to 60°C
Operating position	: Horizontal only
Dimensions (WxHxD)	: 400 x 94 x 277 mm
Weight	: 3.3 kg
Format	: VHS PAL standard
Maximum recording time	
(SP)	: 240 min. with E-240 video cassette
(LP)	: 480 min. with E-240 video cassette

VIDEO/AUDIO

Signal system	: PAL-type colour signal and CCIR monochrome signal, 625 lines/50 fields
Recording system	: DA4 (Double Azimuth) helical scan system (HR-J455EK) Rotary two-head helical scan system (HR-J256/255EK/255ES)
Signal-to-noise ratio	: 45 dB
Horizontal resolution	: 250 lines
Frequency range	: 70 Hz to 10,000 Hz
Input/Output	: 21-pin scart connector x 2 (IN/OUT x 1, IN x 1)

TUNER/TIMER

TV channel storage capacity	: 99 positions (+AUX position)
Tuning system	: Frequency synthesized tuner
Channel coverage	
HR-J455EK/ HR-J256EK/ HR-J255EK	: UHF channels 21 – 69 (470 – 862 MHz)
HR-J255ES	: VHF 44.5 – 143/143 – 470 MHz UHF 470 – 862 MHz
Aerial output	: UHF channels 28 – 60 (Adjustable)
Memory backup time	: Approx. 10 min.

ACCESSORIES

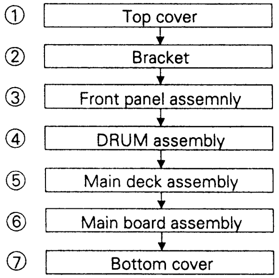
Provided accessories	: RF cable, Infrared remote control unit, "AA" battery x 2

Specifications shown are for SP mode unless otherwise specified.
E.& O.E. Design and specifications subject to change without notice.

SECTION 1
DISASSEMBLY

1.1 DISASSEMBLY FLOW CHART

This flowchart lists the disassembling steps for the cabinet parts and P.C. boards in order to gain access to item(s) to be serviced. When reassembling, perform the step(s) in reverse order. Bend, route and dress the flat cables as they were originally laid.



1.2 HOW TO READ THE DISASSEMBLY AND ASSEMBLY

STEP /LOC NO.	PART NAME	FIG. NO.	POINT	NOTE
①	TOP COVER	D1	4(S1), 1(S2)	
②	BRACKET	D2	2(S3)	
③	FRONT PANEL ASSEMBLY	D3	7(L1)	<NOTE 1> <NOTE 2>
④	DRUM ASSEMBLY	D4	3(S4),WR1,*CN1	<NOTE 3>
⑤	MAIN DECK ASSEMBLY	D5	2(S5),2(S6),WR2, 2(L2), *CN2001	<NOTE 4>
⑥	MAIN BOARD ASSEMBLY	D6	3(S7),1(S8),1(S9) 6(L3)	
⑦	BOTTOM COVER	D7	2(L4), 10(L5)	<NOTE 5>

↑ (1) ↑ (2) ↑ (3) ↑ (4) ↑ (5)

(1) Order of steps in Procedure
When reassembling, perform the step(s) in the reverse order. These numbers are also used as the identification (location) NO. of parts Figures.
(2) Part name to be removed or installed.
(3) Fig.No. showing procedure or part location
(4) Indentification of part to be removed,unhooked,unlocked, released,unpluged,unclamped or unsoldered. P = Spring, W = Washer, S = Screw, L = Locking tab, * = Unhook,unlock, release,unplug or unsolder.
(5) Adjustment information for installation

1.3 DISASSEMBLY/ASSEMBLY METHOD

STEP /LOC NO.	PART NAME	FIG. NO.	POINT	NOTE
①	TOP COVER	D1	4(S1), 1(S2)	
②	BRACKET	D2	2(S3)	
③	FRONT PANEL ASSEMBLY	D3	7(L1)	<NOTE 1> <NOTE 2>
④	DRUM ASSEMBLY	D4	3(S4),WR1,*CN1	<NOTE 3>
⑤	MAIN DECK ASSEMBLY	D5	2(S5),2(S6),WR2, 2(L2), *CN2001	<NOTE 4>
⑥	MAIN BOARD ASSEMBLY	D6	3(S7),1(S8),1(S9) 6(L3)	
⑦	BOTTOM COVER	D7	2(L4), 10(L5)	<NOTE 5>

<NOTE1>
When reattaching the Front panel assembly, make sure that the door opener ⓐ of the Cassette holder assembly is lowered in position prior to the reinstallation.

<NOTE2>
When reattaching the Front panel assembly, pay careful attention to the switch lever not to make it touch the REC switch knob ⓑ of the Main board assembly from the side. (If the REC switch knob of the Main board assembly is damaged, cassette loading is impossible.)

<NOTE3>
When plugging the connector in, check that the flat wire is inserted properly and fully.

<NOTE4>
- When removing the Main deck assembly only, unhook the two spacers connecting it with the Main board assembly with pliers from the back side of the Main board assembly first, and then remove the Main deck assembly.
- When reattaching the Main deck assembly to the Main board assembly, take care not to damage the sensors on the Main board (D3001: LED, Q3001: Start sensor, Q3002: End sensor).

<NOTE5>
When remove the bottom cove, push down the two L4(S) to slide front panel.

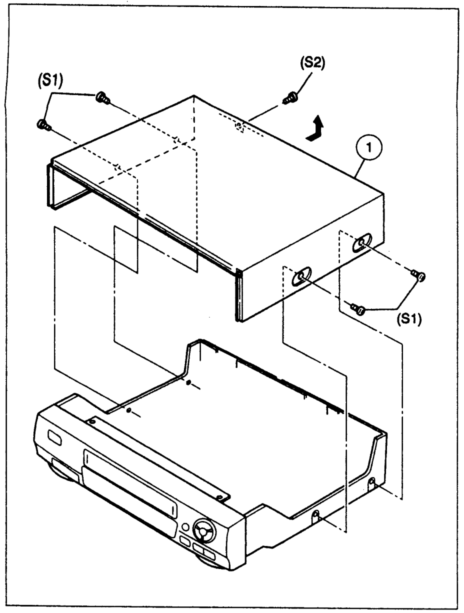


Fig. D1

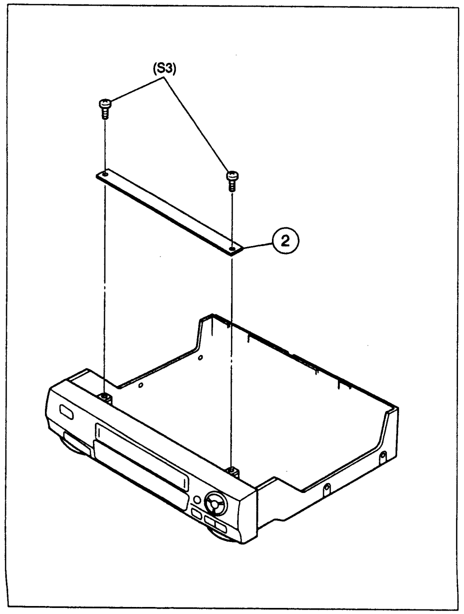


Fig. D2

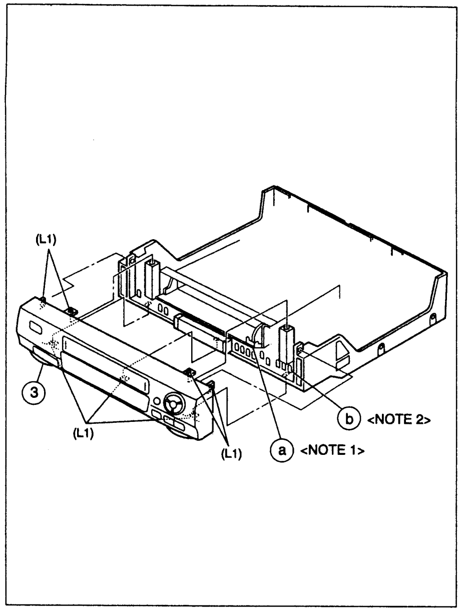


Fig. D3

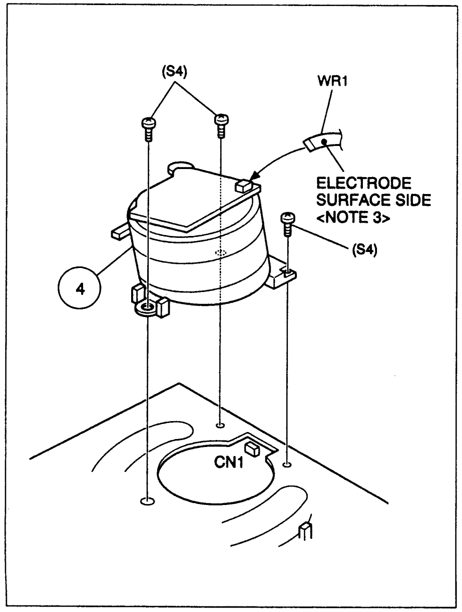

(S4)
WR1
ELECTRODE
SURFACE SIDE
<NOTE 3>
(S4)
④
CN1

Fig. D4

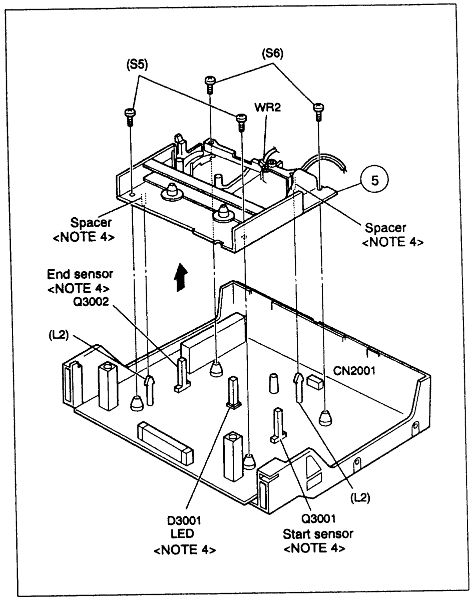

(S5)
(S6)
WR2
⑤
Spacer <NOTE 4>
Spacer <NOTE 4>
End sensor <NOTE 4> Q3002
(L2)
CN2001
(L2)
D3001 LED <NOTE 4>
Q3001 Start sensor <NOTE 4>

Fig. D5

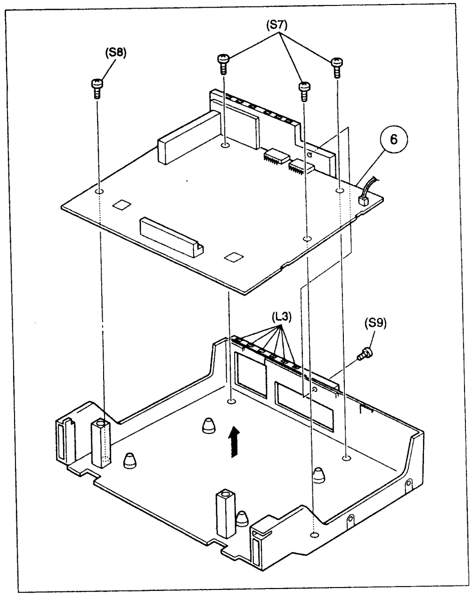


Fig. D6

Procedures for Lowering the Cassette holder assembly

As the mechanism of this unit is integrated with the Housing assembly, the holder must be lowered and the two bolts unscrewed when removing the Main deck assembly.

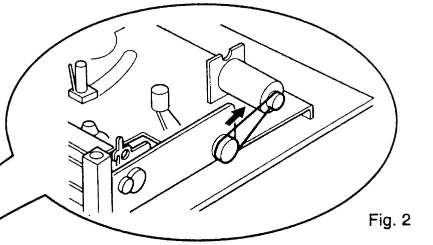


Fig. 2

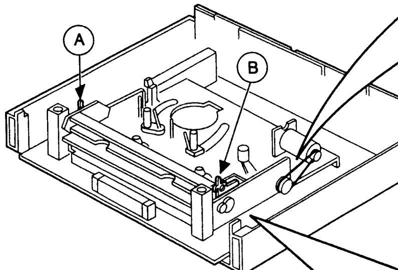


Fig. 1

Turn the loading motor pulley in the direction as indicated by Fig.2. As both Ⓐ and Ⓑ levers are lodged twice, push the levers in the direction as indicated by Fig.3 to release them. When pushing the levers, do it in the order of Ⓐ,Ⓑ,Ⓑ,Ⓐ. When the holder has been lowered, turn the pulley until the cassette holder is securely in place without allowing any up/down movement.

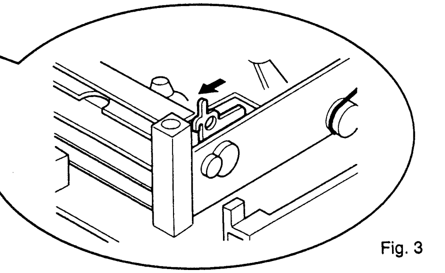


Fig. 3

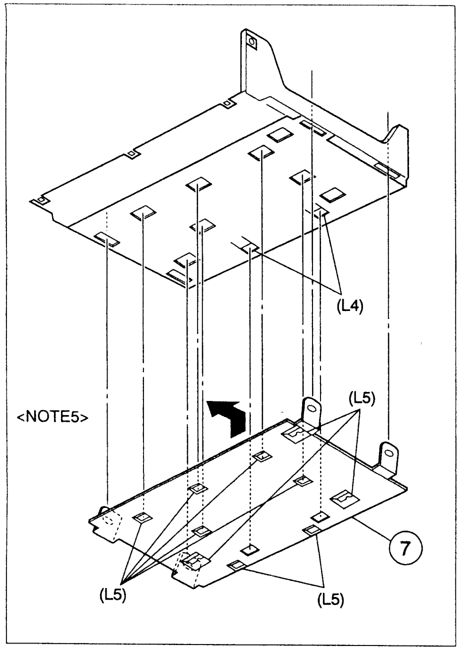


Fig. D7

1.4 SERVICE POSITION

In order to facilitate diagnosis and the repair of the Main deck assembly, this unit is constructed so as to allow the Main deck and the Main board assemblies to be removed together from the Chassis assembly.

1.4.1 How to take out the Mechanism and Main board assemblies

(1) Remove the Top cover, Bracket and Front panel assembly. (See 1.3 DISASSEMBLY/ASSEMBLY METHOD. Take care not to pull the drum wire (Fig.D4) from CN1).
(2) Lower the cassette holder, and make the preparations required in order to remove the bolts from the Main deck assembly (Refer to the "Procedures for Lowering the Cassette holder assembly" on pages 1-3 of 1.3 DISASSEMBLY/ASSEMBLY METHOD).
(3) Take out 2 screws Ⓐ and 2 screws Ⓑ as shown in Fig. 1-4-1.

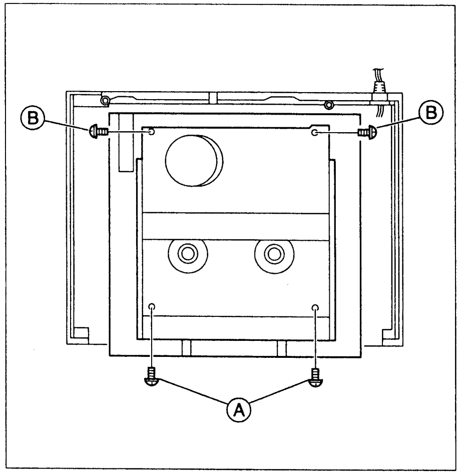


Fig. 1-4-1

(4) Take out 3 screws Ⓓ, 1 screw Ⓒ, and 1 screw Ⓔ.
(5) Remove the Main board and Main deck assemblies together while holding the edge of the Main board. At this stage be careful of the power cord and prongs of the jacks on the back side (See Fig. 1-4-2).

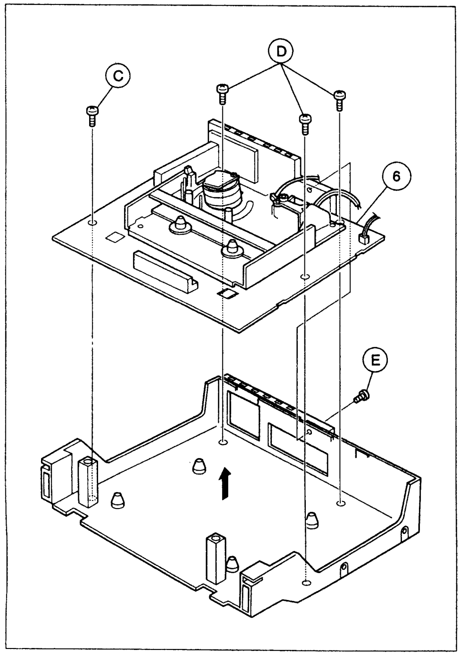


Fig. 1-4-2

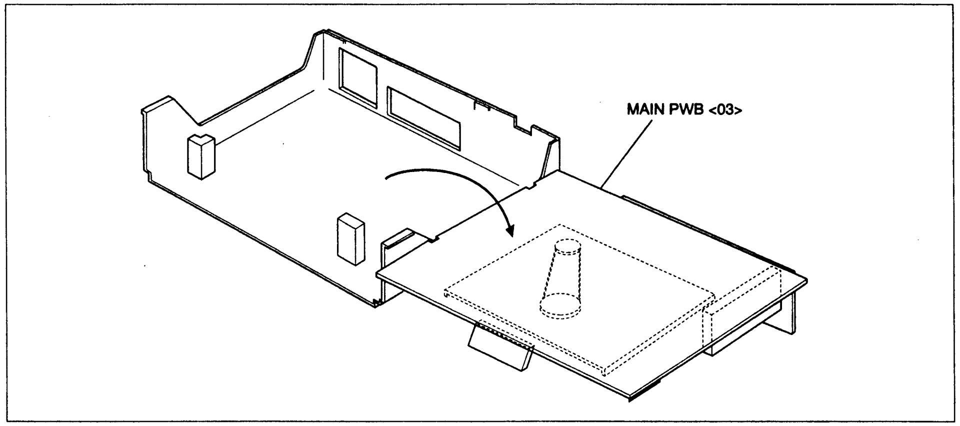


Fig. 1-4-3

(6) Connect the power cord to the wall socket, and lift the cassette holder.
(Before turning on the power make sure that there is nothing which may produce a short circuit, such as faulty soldering.)
(7) When performing a diagnosis or repair of the Main board assembly with a cassette tape in place, turn on the power, insert a cassette tape, and turn over the Main board and Main deck assemblies together.

1.5 MECHANISM SERVICE MODE

This model has a unique function to enter the mechanism into every operation mode without loading of any cassette tape. This function is called the "MECHANISM SERVICE MODE".

1.5.1 How to set the "MECHANISM SERVICE MODE"

(1) Disconnect VCR from AC.
(2) Lower the cassette holder (Refer to the "Procedures for Lowering the Cassette holder assembly" on pages 1-3 of 1.3 DISASSEMBLY/ASSEMBLY METHOD).
(3) Connect TP GND AND TP7001 (TEST) on the Main board assembly with a jump wire.
(4) Connect VCR to AC.
(5) Press the POWER button.
(6) Select the desired operation modes with the operation buttons or remote controller.

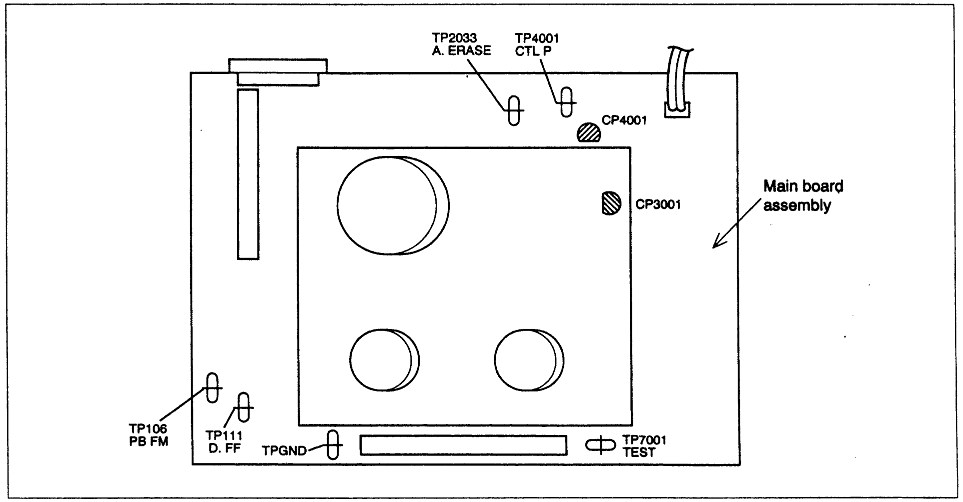


Fig. 1-5-1

1.6 EMERGENCY DISPLAY FUNCTION

This product has the function to store the last two previous emergency faults which can be displayed in the FDP when servicing.

1.6.1 How to display record of an emergency faults

Note: *Put the unit into A mode by using the VCR remote control. (When it is in B mode, the preset remote control codes are not accepted.)*

(1) Press "N" button of the presetting unit More than 2 seconds and the two previous emergency faults are shown in the LED or FDP.

(2) Press "N" button of the presetting unit again to return to the normal mode.

[Example] E : 01 : 03

03 — Emergency fault before last
01 — Emergency fault of the last time

[Example] E : — — : — — ← No record of emergency

1.6.3 How to clear emergency record

Press the COUNTER RESET button on the remote controller in the emergency record display mode, and the record of the emergency fault(s) is cleared.

1.6.2 Detail of emergency foults

EMG DATA	Symptom	Detect mode	Resulting mode
E --	No EMERGENCY		
E 01	Loading motor rotates for more than 4 Sec without shift to next mode.	Loading	POWER OFF
E 02	Loading motor rotates for more than 4 Sec without shift to next mode.	Unloading	POWER OFF
E 03	TU or SUP REEL FG input is absent. (for more than 4 Sec	REC/PLAY/FF/REW SEARCH FF/SEARCH REW	STOP → POWER OFF
E 04	DRUM FF input is absent. (for more than 3 Sec)	REC/PLAY/FF/REW SEARCH FF/SEARCH REW	STOP → POWER OFF
E 05	(NOT USED)	—	—
E 06	CAPSTAN FG input is absent. (for more than 4 Sec)	REC/PLAY/FF/REW SEARCH FF/SEARCH REW	STOP → POWER OFF
E 07	No SWD5V/12V	POWER ON	POWER OFF

Table 1-6-1 EMERGENCY FAULTS-1

1.7 SYSCON CIRCUIT

1.7.1 Syscon CPU pin function (IC3001) 1/2

PIN NO.	LABEL	IN/OUT	NOTE
1	S CURVE/AFT	IN	DC FLUCTUATES BY THE TU RECEIVES SENSITIVITY (USED FOR TUNER SEARCH).
2	START SENSOR	IN	LEADER TAPE DETECT (DETECT ON: L)
3	CTL GAIN	OUT	CONTROL PULSE GAIN CONTROL
4	RF AGC	IN	CHANGES IN ATS+ IC OUTPUT AS CAUSED BY CHANGES IN RECEIVER SENSITIVITY WHEN THE SAME CHANNEL IS RECEIVED MORE THAN ONCE ARE INPUT.
5	END SENSOR	IN	TRAILER TAPE DETECT (DETECT ON: L)
6	BUSY	IN	DATA COMMUNICATIONS PULSES WITH SUB CPU.
7	FDPCS	OUT	FDP IC CHIP SELECT
8	SECAM[H]	-	NC
9	VIDEO ENV.	IN	VIDEO PB FM INPUT
10	PROTECT	IN	SWD 5V/12V DETECT
11	NC	-	NC
12	V. PULSE	OUT	V. PULSE ADDITION TIMING CONTROL
13	N. REC ST (H)	OUT	REC START: H
14	RC IN	IN	REMOTE CONTROL DATA INPUT
15	N. REC [H]	OUT	"H" IS OUTPUT DURING REC AND REC PAUSE.
16	SYNC DET [H]	IN	OSD IC DETERMINES THE PRESENCE OR ABSENCE OF SYNC AND OUTPUTS "H" FOR SYNC. THIS RECEIVES THE "H" OUTPUT OF "H".
17	LOCK DET [L]	IN	THE TU UNIT OUTPUTS "L" WHEN RECEIVING A CERTAIN CH. THIS RECEIVES THE "L" OUTPUT AND VERIFIES THE TU RECEPTION.
18	D. FF	OUT	VIDEO PB FM (CH-1, CH-2) SWITCHING PULSE
19	A. FF	-	NC
20	NC	-	NC
21	NC	-	NC
22	NC	-	NC
23	A. MUTE [H]	OUT	OUTPUTS 'H' DURING AUDIO MUTE, SUCH AS FOR SPECIAL PLAYBACK, CH UP/DOWN, AND POWER ON/OFF.
24	B/W[H]	-	NC
25	3.58NT [H]	OUT	NC
26	LMC1	OUT	LOADING MOTOR DRIVE (1)
27	LMC2	OUT	LOADING MOTOR DRIVE (2)
28	LMC3	OUT	LOADING MOTOR DRIVE (3)
29	CASS SW	-	NC
30	REC SAFETY	IN	REC SAFETY SWITCH DETECT (SW ON: L)
31	LSC	IN	MECHANISM MODE DETECT (C)
32	LSB	IN	MECHANISM MODE DETECT (B)
33	LSA	IN	MECHANISM MODE DETECT (A)
34	NUB	-	NC
35	NUA	-	NC
36	CLK_SEL	IN	SELECTION OF EITHER MAIN X'TAL OR SUB X'TAL AS X'TAL FOR CLOCK.
37	VCC	IN	SYSTEM POWER
38	X IN	IN	SYSTEM CLOCK
39	X OUT	OUT	SYSTEM CLOCK
40	VSS	IN	GND
41	XC IN	IN	TIMER CLOCK
42	XC OUT	OUT	TIMER CLOCK
43	RESET	IN	RESET AT CONNECT VCR TO AC
44	P CTL (H)	OUT	POWER ON/OFF CONTROL (POWER ON: H)
45	TUNER CLK	OUT	SERIAL DATA SHIFT CLOCK OUTPUT
46	TU CE	OUT	TUNER UNIT CHIP ENABLE
47	TUNER DATA	OUT	TUNING CONTROL SERIAL DATA OUTPUT
48	TU_MUTE[H]	OUT	OUTPUTS MUTE "H" TO TUNER PICTURE AT THE TIME OF AUX SELECTION, PLAYBACK, CH SWITCHING, AND SWITCHING TO TU MUTE.
49	SP [L]	-	NC
50	BEST CTL	-	NC

Table 1-7-1 SYSCON CPU pin function(1/2)

1.7.2 Syscon CPU pin function (IC3001) 2/2

PIN NO.	LABEL	IN/OUT	NOTE
51	SECAM TU ON [L] M/DK [H]	-	NC
52	P MUTE (L)	OUT	PICTURE MUTE CONTROL (MUTE ON: L)
53	SUB 0	-	NC
54	SUB 1	-	NC
55	WAKE UP	OUT	OUTPUTS SUB CPU PROGRAM START PULSES.
56	IP_ON[H]	-	NC
57	SCR [H]	-	NC
58	POWER SAVE	OUT	OUTPUTS "L" DURING POWER SAVE, AND "H" OTHERWISE.
59	SECAM VL[H]/M/BG [H]	-	NC
60	SUB CPU RESET	OUT	NC
61	SUB CPU CS	OUT	SUB CPU CHIP SELECT
62	EE [L]	-	NC
63	SECAM DET [H]	-	NC
64	OSD CS	OUT	ON SCREEN IC CHIP ENABLE
65	SUB OUT	OUT	SERIAL DATA OUTPUT TO SUB CPU
66	SUB IN	IN	SERIAL DATA INPUT TO SUB CPU
67	SUB CLK	OUT	SERIAL DATA TRANSFER CLOCK OUTPUT TO SUB CPU
68	DATA O	OUT	SERIAL DATA OUTPUT (TO OSD IC AND FDP IC)
69	DATA I	IN	SERIAL DATA INPUT (FROM FDP IC)
70	S CLK	OUT	SERIAL DATA TRANSFER CLOCK OUTPUT (TO OSD IC AND FDP IC)
71	TEST/I2C CLK	OUT	SERIAL DATA TRANSFER CLOCK TO EEPROM IC, AV1CHIP IC, CH+ IC AND ATS+ IC etc.
72	I2C DATA	OUT	SERIAL DATA OUTPUT TO EEPROM IC, AV1CHIP IC, CH+ IC AND ATS+ IC etc.
73	PB SPE [L]	OUT	OUTPUTS "L" DURING SPECIAL PLAYBACK.
74	NC	-	NC
75	NC	-	NC
76	CAP REV (L)	OUT	CAPSTAN MOTOR CONTROL (FWD: H/REV: L)
77	CAP CTL V	OUT	CAPSTAN MOTOR CONTROL VOLTAGE
78	DRUM CTL V	OUT	DRUM MOTOR CONTROL VOLTAGE
79	SP FG	IN	SUPPLY REEL ROTATION DET/TAPE REMAIN
80	TU FG	IN	TAKE-UP REEL ROTATION DET/TAPE REMAIN
81	R. PAUSE_IN	IN	NC
82	POWER DET	IN	A PORT TO VERIFY THAT AL POWER IS UP. NORMALLY AT "L".
83	C	-	NC
84	C. SYNC	IN	COMPOSITE SYNC
85	C. FG IN	IN	CAPSTAN FG PULSE INPUT
86	D. PG IN	IN	DRUM PICKUP PULSE INPUT (SWITCHING PULSE)
87	D. FG IN	IN	DRUM FG PULSE INPUT
88	AMP VSS	-	GND(ANALOG AMP)
89	AMP V REF OUT	-	AMP CIRCUIT REFERENCE VOLTAGE OUTPUT
90	AMP V REF IN	-	AMP CIRCUIT REFERENCE VOLTAGE INPUT
91	CTL-	IN/OUT	CTL (-) SIGNAL
92	CTL+	IN/OUT	CTL (+) SIGNAL
93	CTL SW OUT	OUT	CTL SWITCH OUTPUT
94	CTL AMP IN	IN	CTL AMP INPUT
95	AMP C	IN	CAPACITOR CONNECT TERMIAL FOR CTL AMP CIRCUIT
96	CTL VSS	-	CTL AMP CIRCUIT REFERENCE Vss
97	CTL AMP OUT	OUT	CTL AMP OUTPUT
98	AMP VCC	IN	CTL AMP POWER, ANALOG AMP POWER
99	AVCC	IN	SYSTEM POWER, AD/DA CONVERT STANDARD VOLTAGE
100	MESECAM DET [H]	IN	"H" IS INPUT DURING PLAYBACK OR WHEN THE EXTERNAL INPUT SIGNALS ARE MESECAM.

Table 1-7-2 SYSCON CPU pin function(2/2)

SECTION 2
MECHANISM ADJUSTMENT

2.1 BEFORE STARTING REPAIR AND ADJUSTMENT

2.1.1 Precautions

(1) Unplug the power cable of the main unit before using your soldering iron.
(2) Take care not to cause any damage to the conductor wires when plugging and unplugging the connectors.
(3) Do not randomly handle the parts without identifying where the trouble is.
(4) Exercise enough care not to hurt yourself, especially your finger nails, during the repair work.
(5) When installing the front panel assembly, be sure to hook the lug on the back side of cassette door to the door opener of the cassette holder. If this operation is neglected it will not be possible to remove the cassette when ejecting because the housing door cannot be opened.

2.1.2 Checking for Proper Mechanical Operations

Enter the mechanism service mode when you want to operate the mechanism when no cassette is loaded. (See 1.5 MECHANISM SERVICE MODE)

2.1.3 Manually Removing the Cassette Tape

1. In case of electrical failures

If you cannot remove the cassette tape which is loaded because of any electrical failure, manually remove it by taking the following steps.

(1) Unplug the power cable and remove the top cover, bracket and, front panel assembly.
(See 1.3 DISASSEMBLY/ASSEMBLY METHOD)
(2) Unload the cassette by manually turning the unloading motor of the main deck assembly toward the front. In doing so, hold the tape by the hand to keep the slack away from any grease. (See Fig.2-1-1)
(3) Bring the pole base assembly (on the supply or take-up side) to a pause when it reaches the position where it is hidden behind the cassette tape.
(4) Move the top plate toward the drum while holding down the lug Ⓐ of the bracket retaining the top plate. Likewise hold part Ⓑ down and remove the top plate.
The spring plate Ⓒ is then brought under the cassette lid. Then remove the top plate by pressing the whole cassette tape down. (Note 1) (See Fig.2-1-2).
(5) Remove the cassette tape by holding both the slackened tape and the cassette lid.
(6) Take up the slack of the tape into the cassette. This completes removal of the cassette tape.

Note: *The spring plate of the top plate is sharp-edged. Take care not to hurt yourself.*

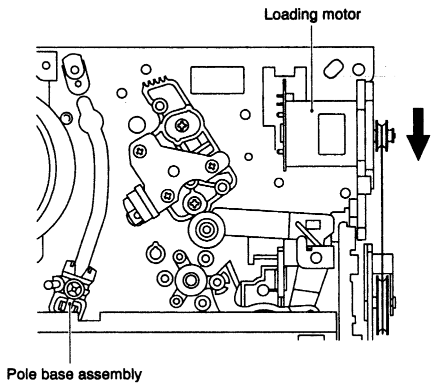


Fig. 2-1-1

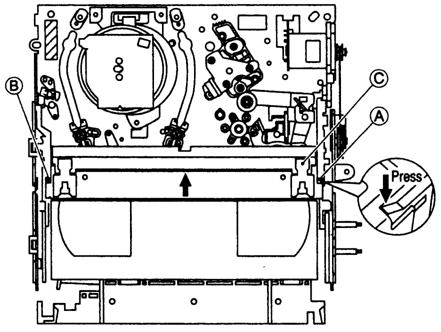


Fig. 2-1-2

2. In case of mechanical failure

If you cannot remove the cassette tape which is loaded because of any mechanical failure, manually remove it by taking the following steps.

(1) Unplug the power cable and remove the top cover, bracket, front panel assembly, stay and Drum shield (See 1.3 DISASSEMBLY/ASSEMBLY METHOD).

(2) While keeping the tension arm of the main deck assembly free from tension, pull the tape on the pole base assembly out of the guide roller (on the supply or take-up side) (See Fig.2-1-3).

(3) Remove the top plate as done in Step (4) of "1 In case of electrical failures" and remove the guide pole cap at the same time. (See Fig.2-1-4).

(4) While lifting the cassette tape lid, hold the cassette tape case and pinch roller by the fingers and move them toward the loading motor to relieve pressure on the tape. Then remove the tape while taking the cassette case out of the cassette holder. (See Fig.2-1-4).

(5) Re-place the guide pole cap and take up the slack of the tape into the cassette.

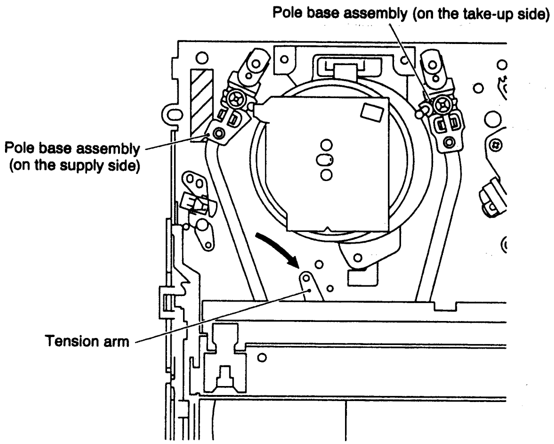

Pole base assembly (on the take-up side)
Pole base assembly (on the supply side)
Tension arm

Fig. 2-1-3

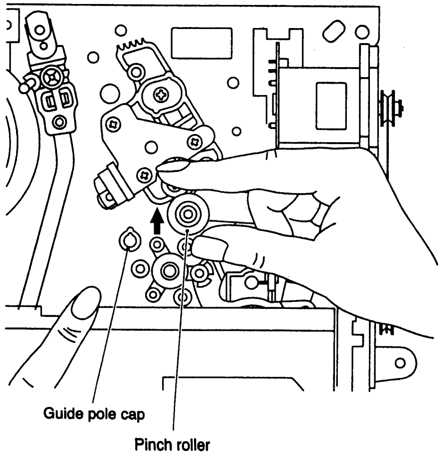

Guide pole cap
Pinch roller

Fig. 2-1-4

2.1.4 Jigs and Tools Required for Adjustment

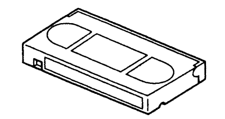
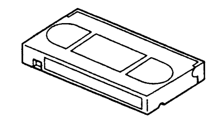
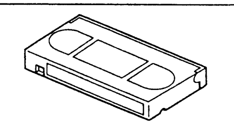
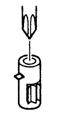
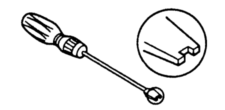
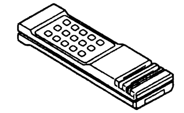
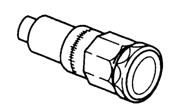
Alignment tape (SP) MHPE	Alignment tape (LP) MHPE-L	Back tension cassette gauge PUJ48076-2	A/C head position bit PTU94010
			
Roller driver PTU94002	Presetting unit PTU94008	Torque gauge PUJ48075-2	
			

Table 2-1-1 Jigs and tools required for adjustment

2.1.5 Maintenance and Inspection

1. Location of major mechanical parts

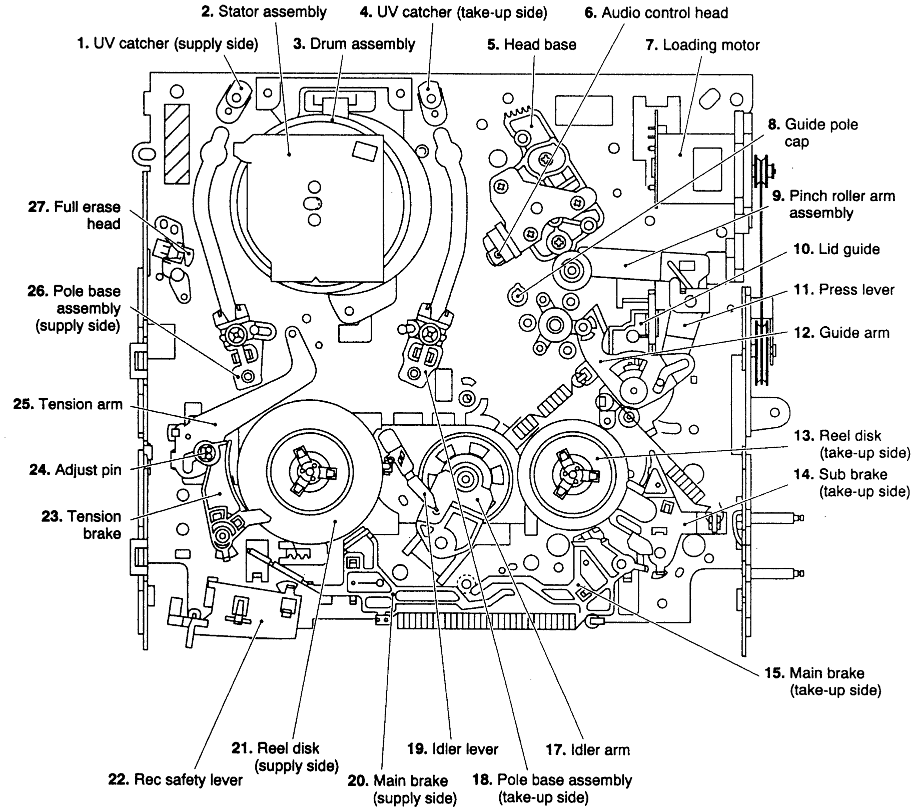

2. Stator assembly
4. UV catcher (take-up side)
6. Audio control head
1. UV catcher (supply side)
3. Drum assembly
5. Head base
7. Loading motor
8. Guide pole cap
9. Pinch roller arm assembly
10. Lid guide
11. Press lever
12. Guide arm
13. Reel disk (take-up side)
14. Sub brake (take-up side)
15. Main brake (take-up side)
27. Full erase head
26. Pole base assembly (supply side)
25. Tension arm
24. Adjust pin
23. Tension brake
21. Reel disk (supply side)
22. Rec safety lever
20. Main brake (supply side)
19. Idler lever
18. Pole base assembly (take-up side)
17. Idler arm

Fig. 2-1-5 Main deck top side

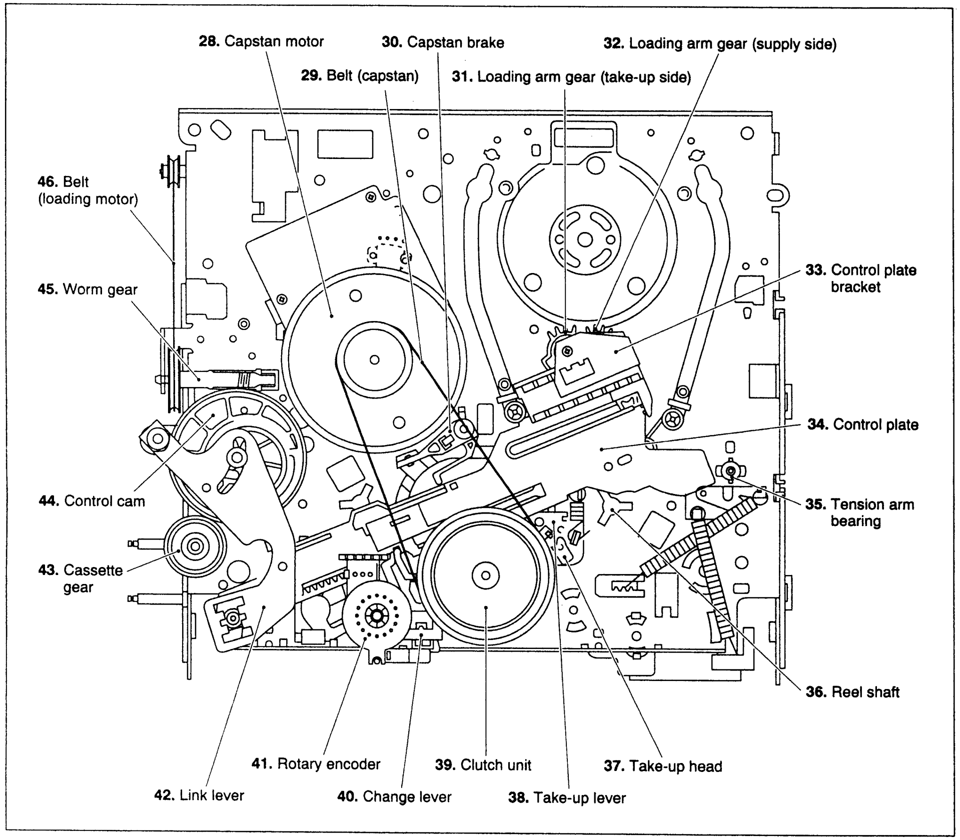

28. Capstan motor
30. Capstan brake
32. Loading arm gear (supply side)
29. Belt (capstan)
31. Loading arm gear (take-up side)
46. Belt (loading motor)
45. Worm gear
33. Control plate bracket
34. Control plate
44. Control cam
35. Tension arm bearing
43. Cassette gear
36. Reel shaft
41. Rotary encoder
39. Clutch unit
37. Take-up head
42. Link lever
40. Change lever
38. Take-up lever

Fig. 2-1-6 Main deck bottom side

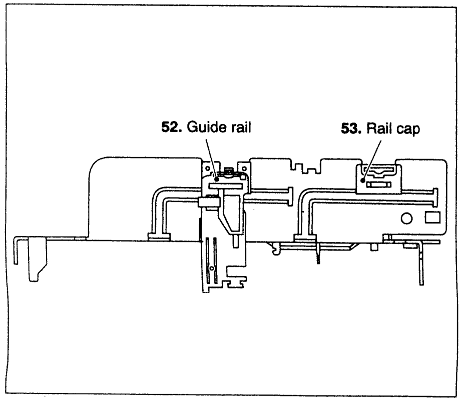

52. Guide rail
53. Rail cap

Fig. 2-1-7 Main deck left side

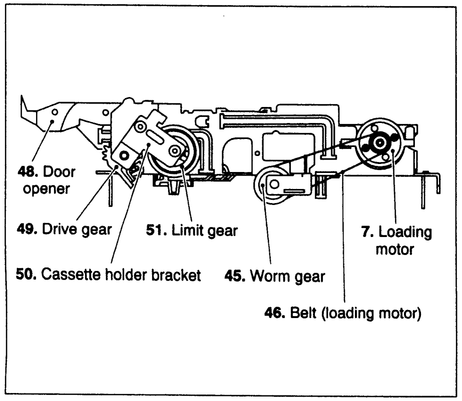

48. Door opener
49. Drive gear
51. Limit gear
7. Loading motor
50. Cassette holder bracket
45. Worm gear
46. Belt (loading motor)

Fig. 2-1-8 Main deck right side

Note: *Numerals at the start of the parts names are identical with those of the location diagrams of the major mechanical parts, 1 - 18 of which denote the order of removal. Of the alphabets T and B next to the parts names, T denotes removal from the main deck top side, B from the bottom side and T/B from both sides.*

			1.4	12	53	46	9	52	11	50	-	-	-	49	32	-	-	38	25	23	31	21	42	41	29	39	40	33	34	14	19
	Replacement parts names Removable parts names		UV catcher	Guide arm assembly	Rail cap	Belt (loading motor)	Pinch roller arm assembly	Guide rail	Press lever assembly	Cassette Holder bracket	Opener guide	Relay gear	Cassette holder assembly	Drive gear	Loading arm gear (supply side)	Drive arm assembly	Tension spring	Take-up lever	Tension arm assembly	Tension brake assembly	Loading arm gear (take-up side)	Reel base (supply side)	Link lever	Rotary encoder	Belt (capstan motor)	Clutch unit	Change lever	Control plate bracket	Control plate	Sub brake	Idler lever
17	Idler arm	T			1			2		3	4	5	6	7		8				9		10	11	12	13	14	15	16	17		18
15	Main brake (take-up side)	T/B			1			2		3	4	5	6	7		8							9	10	11	12	13	14	15	16	
13	Reel disk (take-up side)	T			1			2		3	4	5	6	7		8							9	10	11	12	13	14	15	16	
19	Idler lever	T/B			1			2		3	4	5	6	7		8				9		10	11	12	13	14	15	16	17		
-	Rotary encoder guide	T/B			1			2		3	4	5	6	7		8							9	10	11	12	13	14	15	16	
14	Sub brake (take-up side)	T/B			1			2		3	4	5	6	7		8							9	10	11	12	13	14	15		
-	Loading arm gear shaft	B													8						9		1	2	3	4	5	6	7		
35	Tension arm bearing	T			1			2		3	4	5	6				8		9	7											
-	Control plate guide	T/B																8					1	2	3	4	5	6	7		
37	Take-up head	B																8					1	2	3	4	5	6	7		
31	Loading arm gear (take-up side)	B													8								1	2	3	4	5	6	7		
25	Tension arm assembly	T/B			1			2		3	4	5	6				8			7											
20	Main brake (supply side)	T/B			1			2		3	4	5	6	7		8															
38	Take-up lever	T/B																					1	2	3	4	5	6	7		
32	Loading arm gear (supply side)	B																					1	2	3	4	5	6	7		
21	Reel disk (supply side)	T			1			2		3	4	5	6	7																	
-	Drive arm assembly	T			1			2		3	4	5	6	7																	
30	Capstan brake	T/B																					1	2	3	4	5	6	7		
34	Control plate	B																					1	2	3	4	5	6			
23	Tension brake assembly	T/B			1			2		3	4	5	6																		
-	Cassette holder assembly	T			1			2		3	4	5																			
-	Direct gear	B																						1	2	3	4				
10	Lid guide	T		1			2		3																						
40	Change lever	B																						1	2	3					
49	Drive gear	T								1	2	3																			
11	Press lever assembly	T		1			2																								
-	Relay gear	T								1	2																				
51	Limit gear assembly	T								1	2																				
26	Pole base assembly (supply side)	T/B	1																												
18	Pole base assembly (take-up side)	T/B	1																												
-	Tension spring (Main brake)	T																													
22	Rec safety lever	T/B																													
28	Capstan motor	T/B																							1						
45	Worm gear	B				1																									
44	Control cam	B																					1								
43	Cassette gear	B																					1								
39	Clutch unit	B																							1						
9	Pinch roller arm assembly	T		1																											
-	Opener guide	T								1																					
8	Guide pole cap	T																													
1,4	UV catcher	T																													
42	Link lever	B																													
41	Rotary encoder	B																													
12	Guide arm assembly	T																													
50	Cassette holder bracket	T																													
52	Guide rail	T																													
53	Rail cap	T																													
7	Loading motor assembly	T																													
5	A/C head assembly	T																													

2. Cleaning

Regular cleaning of the transport system parts is desirable but practically impossible. So make it a rule to carry out cleaning of the tape transport system whenever the machine is serviced.
When the video head, tape guide and/or brush get soiled, the playback picture may appear inferior or at worst disappear, resulting in possible tape damage.

(1) When cleaning the upper drum (especially the video head), soak a piece of closely woven cloth or Kimu-wipe with alcohol and while holding the cloth onto the upper drum by the fingers, turn the upper drum counterclockwise.

Note: *Absolutely avoid sweeping the upper drum vertically as this will cause damage to the video head.*

(2) To clean the parts of the tape transport system other than the upper drum, use a piece of closely woven cloth or a cotton swab soaked with alcohol.
(3) After cleaning, make sure that the cleaned parts are completely dry before using the video tape.

3. Lubrication

With no need for periodical lubrication, you have only to lubricate new parts after replacement. If any oil or grease on contact parts is soiled, wipe it off and newly lubricate the parts.

(1) See the mechanism assembly and disassembly diagrams (M4) for the lubricating or greasing spots. See Table 2-1-2 for the types of oil or grease to be used.

Type	Name	Serial No.	Symbols on the disassembly diagrams
Grease	Maltemp SH-P	KYODO-SH-P	AA
Oil	Cosmohydro HV56	COSMO-HV56	BB

Table 2-1-2 Grease and oil used for the unit

4. Suggested servicing schedule for main components

The following table indicates the suggested period for such service measures as cleaning,lubrication and replacement. In practice, the indicated periods will vary widely according to environmental and usage conditions.However, the indicated components should be inspected when a set is brought for service and the maintenance work performed if necessary. Also note that rubber parts may deform in time,even if the set is not used.

System	Parts Name	Operation Hours	
		~1000H	~2000H
Tape transport	Upper drum assembly	★○	○
	A/C head	★○	★○
	Lower drum assembly	★	★○
	Pinch roller arm assembly	★	★
	Full erase head	★	★
	Tension arm assembly	★	★
	Capstan motor (Shaft)	★	★
	Guide arm assembly	★	★
Drive	Capstan motor		○
	Capstan brake		○
	Main brake		○
	Belt (Capstan)	○	○
	Belt (Loading motor)		○
	Loading motor		○
	Clutch unit		○
	Worm gear assembly		○
	Control plate		○
Other	Brush assembly	★○	★○
	Tension brake	○	○
	Rotary encoder		○

★: Cleaning
○: Inspection or Replacement if necessary

Table 2-1-3

2.2 REPLACEMENT OF MAJOR PARTS

2.2.1 Before Starting Disassembling

This unit is provided with a mechanism assembly mode. It is therefore necessary to enter this mode for assembling and disassembling procedures.
This mode is usually not in use, manually set it when it is required.

2.2.2 How to Set the Mechanism Assembling Mode

Remove the main deck assembly and place it bottom side up. (See SECTION 1 DISASSEMBLY). Turn the worm gear toward the front so that the register hole of the control cam is brought into alignment with the hole at the main deck assembly chassis. This position renders the mechanism assembling mode operational. Make sure that the control plate is located in alignment with the mark E. (See Fig.2-2-1)

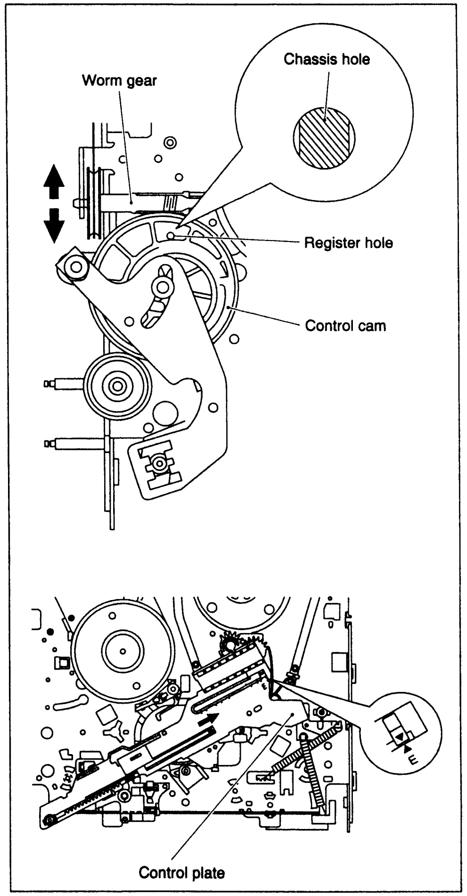


Fig. 2-2-1

2.2.3 Cassette Holder Assembly

1. How to remove

(1) Remove the guide rail and rail cap. (See Fig.2-2-2).
(2 lugs on the guide rail and one lug on the rail cap)

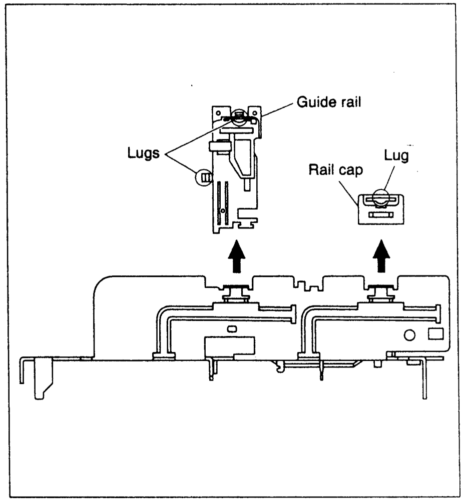


Fig. 2-2-2

(2) Remove the two slit washers and remove the cassette holder bracket. (See Fig.2-2-3)
(3) Remove the opener guide, elay gear and limit gear. (See Fig.2-2-3)

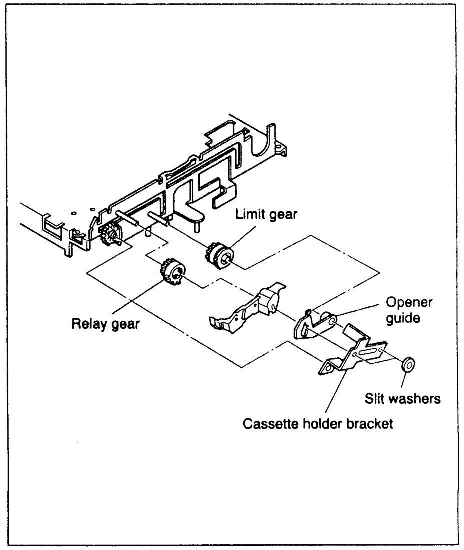


Fig. 2-2-3

(4) While swinging the lock levers (R) and (L) of the cassette holder assembly toward the front, slide the cassette holder assembly until its legs come to where the guide rail and the rail cap have been removed (so that the drive arm is upright). (See Fig.2-2-4)

(5) While holding the left side of the cassette holder, lift the cassette holder assembly so that the three legs on the left side are all released. Then pull the legs Ⓐ and Ⓑ on the right side out of the rail and also pull up the leg Ⓒ. (See Fig.2-2-5, Fig.2-2-6)

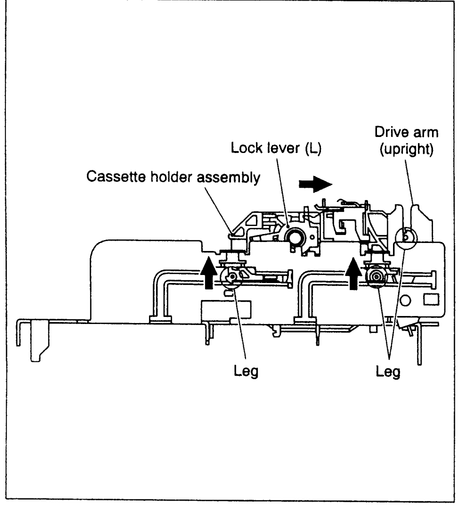

Drive arm
(upright)
Lock lever (L)
Cassette holder assembly
Leg
Leg

Fig. 2-2-4

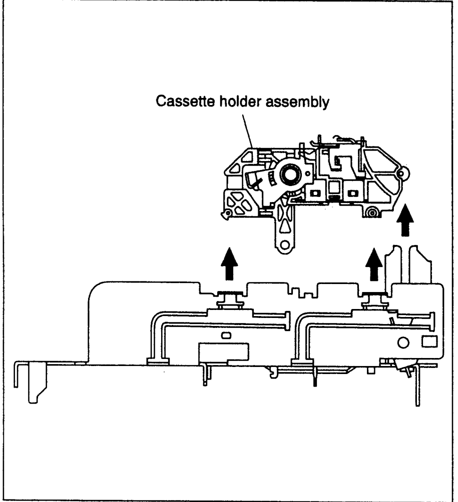

Cassette holder assembly

Fig. 2-2-5

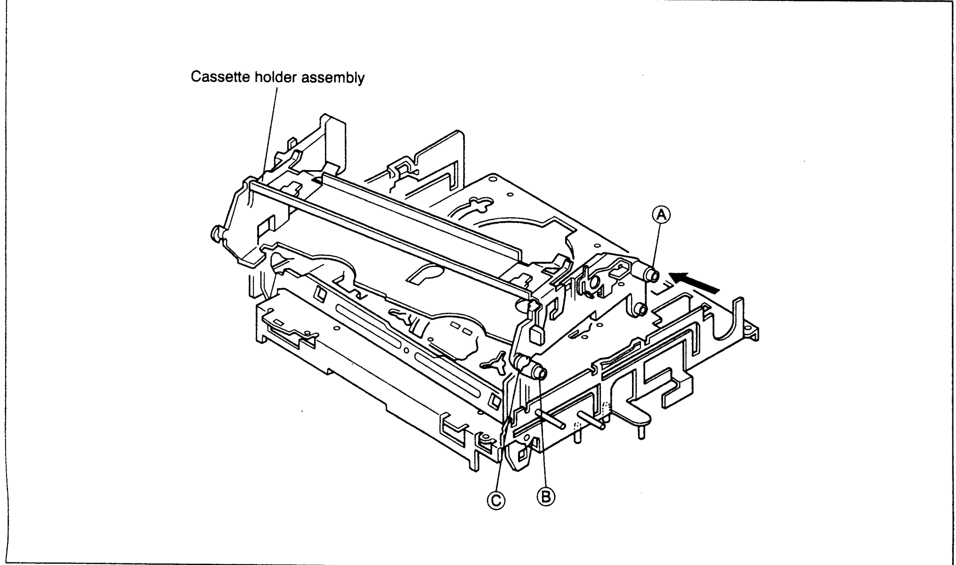

Cassette holder assembly
Ⓐ
Ⓒ
Ⓑ

Fig. 2-2-6

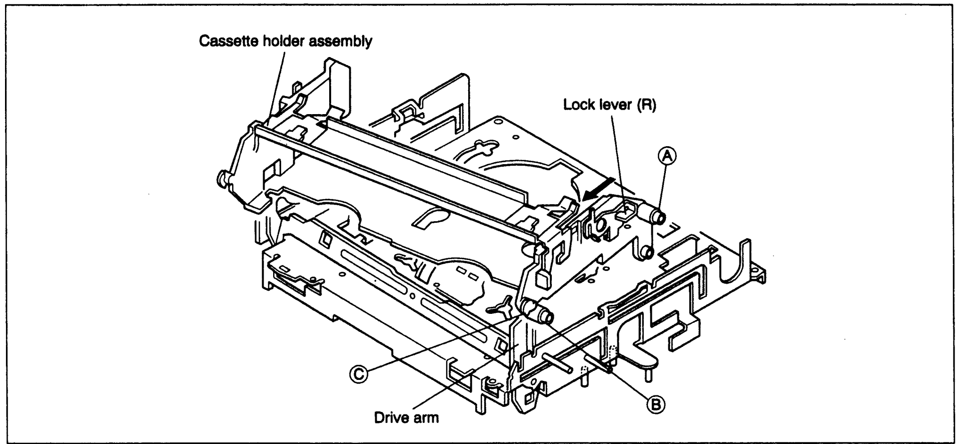

Cassette holder assembly
Lock lever (R)
Ⓐ
Ⓒ
Drive arm
Ⓑ

Fig. 2-2-7

2. How to install

(1) Hold the drive arm upright and fit the leg Ⓒ on the right side of the cassette holder assembly into the groove. (See Fig.2-2-7)

(2) While swinging the lock lever (R) of the cassette holder assembly toward front, put the legs Ⓐ and Ⓑ into the rail. (See Fig.2-2-7)

(3) Drop the three legs on the left side of the cassette holder into the groove at one time. (See Fig.2-2-8)

(4) Slide the whole cassette holder toward the front to bring it to the eject end position.

(5) Install the limit gear so that the notch on the outer circumference of the limit gear is brought into alignment with the register hole on the main deck. (See Fig.2-2-9)

(6) Install the relay gear so that the notch on the outer circumference of the relay gear is brought into alignment with the notch on the main deck. It is important at this stage that the register hole at the limit gear, the register hole at the relay gear and the register hole at the drive gear are all in alignment. (See Fig.2-2-9).

(7) Install the door stopper, opener guide and cassette holder bracket and fasten the two slit washers.

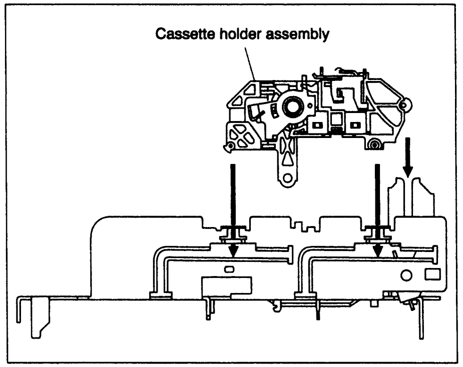

Cassette holder assembly

Fig. 2-2-8

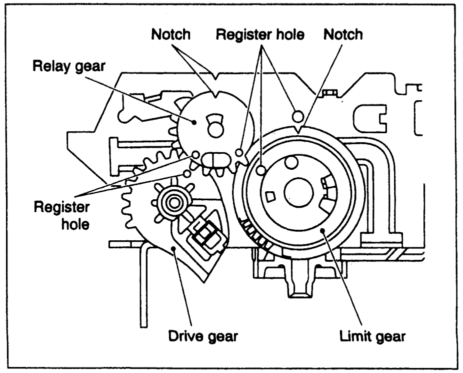

Notch
Register hole
Notch
Relay gear
Register
hole
Drive gear
Limit gear

Fig. 2-2-9

2.2.4 Pinch Roller Arm Assembly

1. How to remove

(1) Remove the spring from the hook of the press lever.
(2) Remove the slit washer and remove the pinch roller seat. (See Fig.2-2-10)
(3) Remove the pinch roller arm assembly by pulling it up.

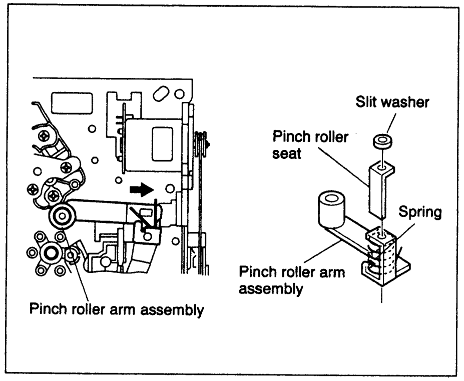

Slit washer
Pinch roller seat
Spring
Pinch roller arm assembly
Pinch roller arm assembly

Fig. 2-2-10

2.2.5 Guide Arm and Press Lever

1. How to remove

(1) Remove the spring and expand the lug of the lid guide in the arrow-indicated direction. Then remove the guide arm by pulling it up.
(2) Remove the press arm by pulling it up. (See Fig.2-2-11)

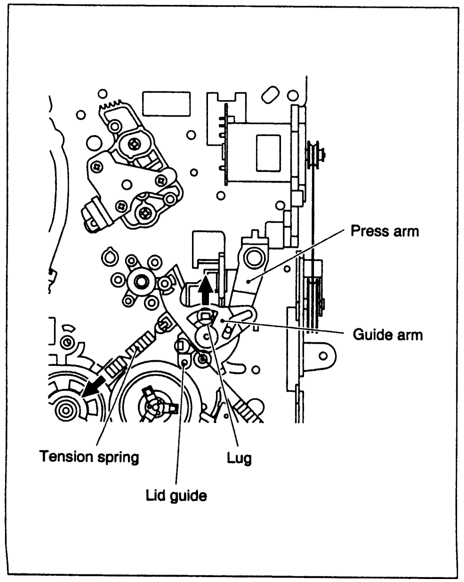

Press arm
Guide arm
Tension spring
Lug
Lid guide

Fig. 2-2-11

2.2.6 Audio Control Head

1. How to remove

(1) Remove two screws (A) and remove the audio control head together with the head base.

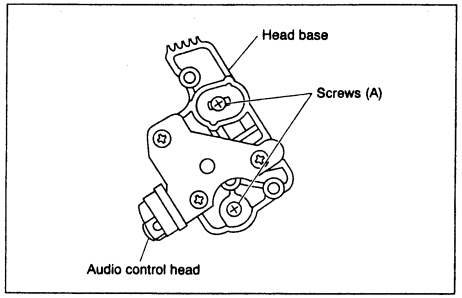

Head base
Screws (A)
Audio control head

Fig. 2-2-12

(2) When replacing only the audio control head, remove the three screws (B) while controlling the compression spring.

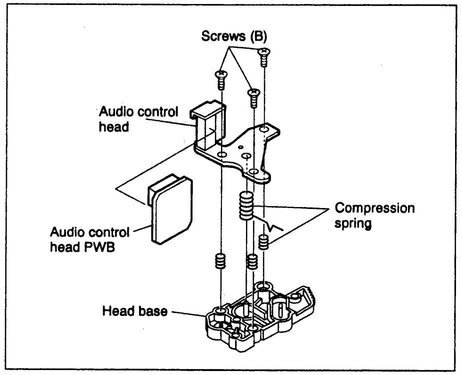

Screws (B)
Audio control head
Compression spring
Audio control head PWB
Head base

Fig. 2-2-13

2. How to install

(1) To make the post-installation adjustment easier, set the temporary level as indicated in Fig.2-2-14. Also make sure that the screw center is brought into alignment with the center position of the slot.

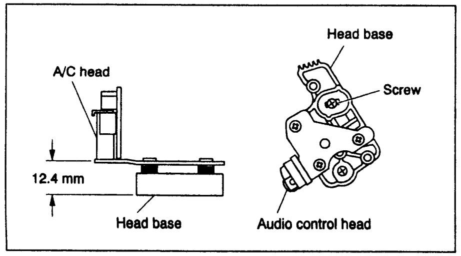

Head base
A/C head
Screw
12.4 mm
Head base
Audio control head

Fig. 2-2-14

2.2.7 Loading Motor

1. How to remove

(1) Remove the belt wound around the worm gear.
(2) Open the two lugs of the motor guide and remove the loading motor, loading motor PWB and motor guide altogether by pulling them up.
(3) When replacing the motor base, take care with the orientation of the motor (so that the label faces upward).
(4) When the motor pulley has been replaced, choose the fitting dimension as indicated in Fig.2-2-15.

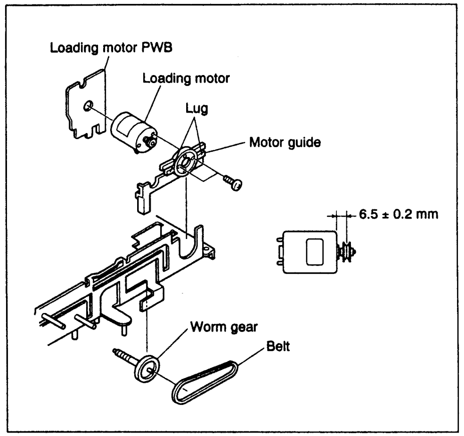

Loading motor PWB
Loading motor
Lug
Motor guide
6.5 ± 0.2 mm
Worm gear
Belt

Fig. 2-2-15

2.2.8 Capstan Motor

1. How to remove

(1) Remove the belt (capstan) on the main deck back side.
(2) Remove three screws (A) and remove the capstan motor.

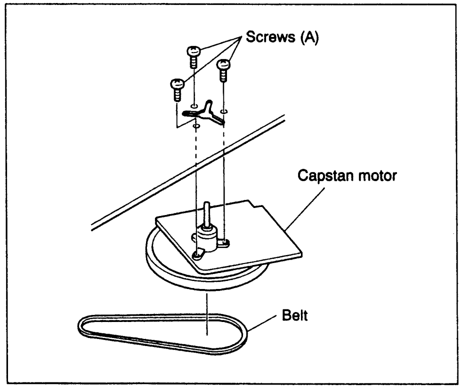

Screws (A)
Capstan motor
Belt

Fig. 2-2-16

2. How to install

Please refer to page 2-25.

2.2.9 Pole Base (on the supply or take-up side)

1. How to remove

(1) Remove the UV catcher on the removal side by loosening one screw (A).
(2) Remove the pole base on the supply side from the main deck by loosening one screw (B) on the main deck back side and sliding the pole base toward the UV catcher.
(3) As for the pole base on the take-up side, turn the pulley of the loading motor to lower the cassette holder because the screw (B) is hidden under the control plate (See the "Procedures for Lowering the Cassette holder assembly" on page 1-3 of 1.3 DISASSEMBLY/ASSEMBLY METHOD). Further turn the motor pulley to move the cassette holder until the screw (B) is no longer under the control plate (in the half-loading position). Then remove it as done for the supply side by removing one screw (B).

NOTE: *After reinstalling the Pole base and the UV catcher, be sure to perform compatibility adjustment.*

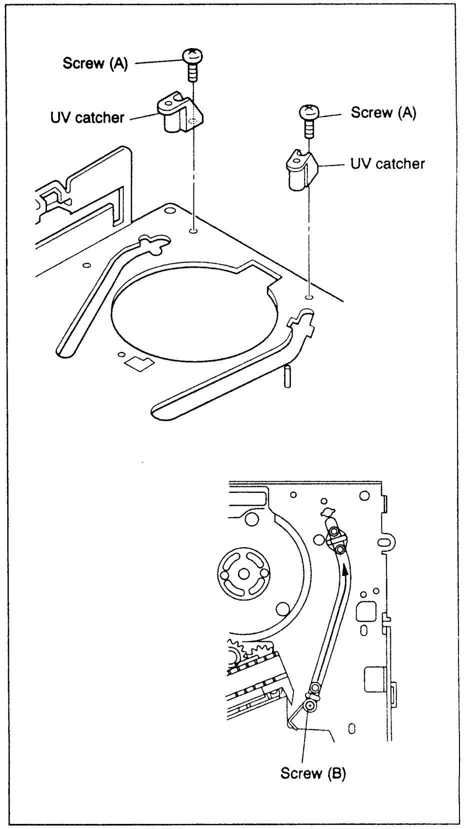

Screw (A)
UV catcher
Screw (A)
UV catcher
Screw (B)

Fig. 2-2-17

2.2.10 Rotary Encoder

(1) Remove one screw (A) and remove the rotary encoder by pulling it up.

(2) When installing the rotary encoder, bring the register marks into alignment as indicated in Fig.2-2-18.

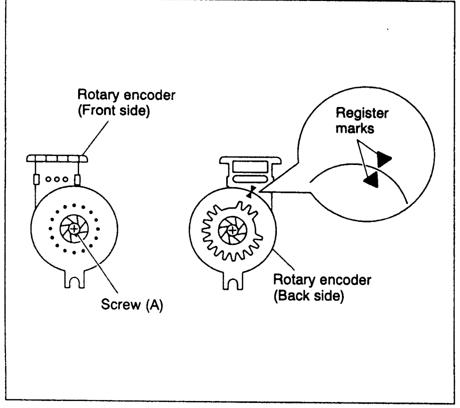

Rotary encoder (Front side)
Register marks
Screw (A)
Rotary encoder (Back side)

Fig. 2-2-18

2.2.11 Clutch Unit

(1) Remove the belt wound around the capstan motor and the clutch unit.

(2) Remove the slit washer and remove the clutch unit.

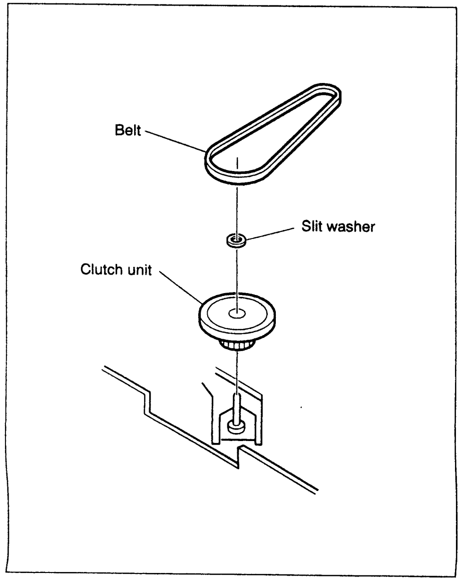

Belt
Slit washer
Clutch unit

Fig. 2-2-19

2.2.12 Change Lever and Direct Gear

(1) Release two lugs of the rotary encoder guide in the arrow-indicated direction and remove the change lever.

(2) Remove the slit washer retaining the direct gear and remove the latter.
Take care of the two washers and one spring on and under the direct gear. (See Fig.2-2-20)

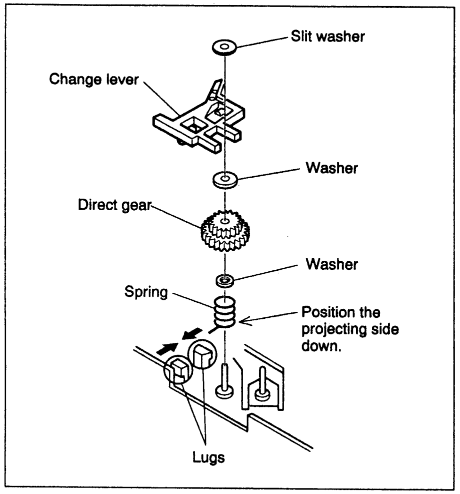

Slit washer
Change lever
Washer
Direct gear
Washer
Spring
Position the projecting side down.
Lugs

Fig. 2-2-20

2.2.13 Link Lever

(1) Remove the two slit washers.

(2) Remove the link lever by lifting it from the shaft retained by the slit washers. Then swing the link lever counterclockwise and remove it from the lock member of the control plate.

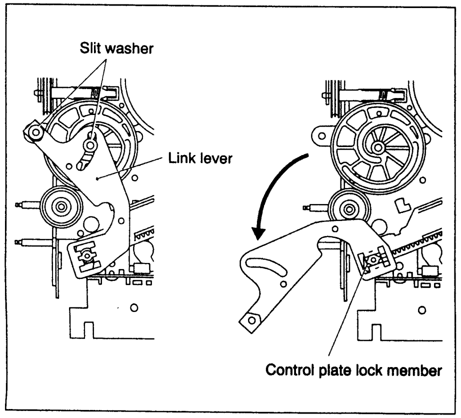

Slit washer
Link lever
Control plate lock member

Fig. 2-2-21

2.2.14 Cassette Gear, Control Cam and Worm Gear

(1) Remove the control cam by lifting it.

(2) Open the two lugs of the cassette gear outward and pull the latter off.

(3) Remove the belt wound around the worm gear and the loading motor.

(4) Open the lug of the lid guide outward and remove the worm gear.

(5) When installing the control cam, make sure that the register hole at the control cam is in alignment with the register hole of the main deck. (See Fig.2-2-22)

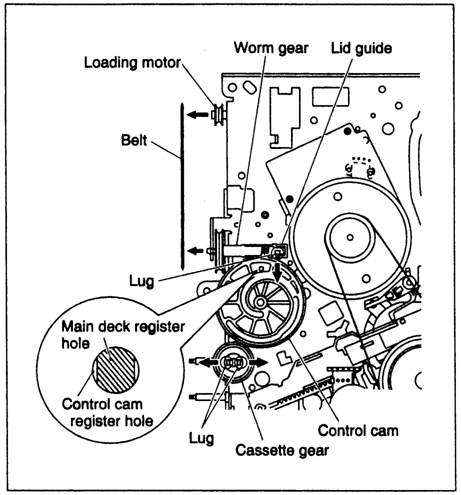

Loading motor
Worm gear
Lid guide
Belt
Lug
Main deck register hole
Control cam register hole
Lug
Cassette gear
Control cam

Fig. 2-2-22

2.2.15 Control Plate

1. How to remove

(1) Remove one screw (A) retaining the control plate bracket and remove the latter.

(2) Slide the control plate as indicated by the arrow and remove the control plate. (See Fig.2-2-23)

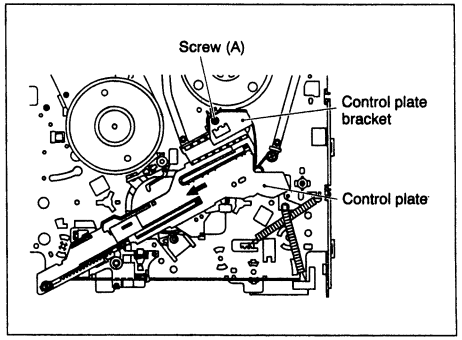

Screw (A)
Control plate bracket
Control plate

Fig. 2-2-23

2. How to install

(1) Adjust the position of the idler arm pin as indicated in Fig.2-2-24. (to the left of center of the R section)

(2) Bring the positioning hole of the take-up lever into alignment with the hole at the control plate guide and fix the position by inserting a 1.5 mm hexagonal wrench.

(3) Press-fit the pole base (on the supply side) as indicated by the arrow and install the control plate so that section A of the loading arm gear shaft fits into hole (A) of the control plate, section B of the control plate guide into hole (B), and the control plate comes under section C of the rotary encoder guide and section D of the loading arm (on the take-up side). Then slide the whole control plate in the arrow-indicated direction. (See Fig.2-2-25).

(4) Make sure that the mark E of the control plate is in alignment with the mark ▼ of the loading arm gear shaft. (See Fig.2-2-25)

(5) Pull off the hexagonal wrench for positioning.

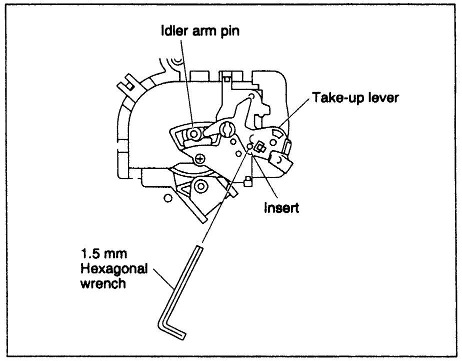

Idler arm pin
Take-up lever
Insert
1.5 mm Hexagonal wrench

Fig. 2-2-24

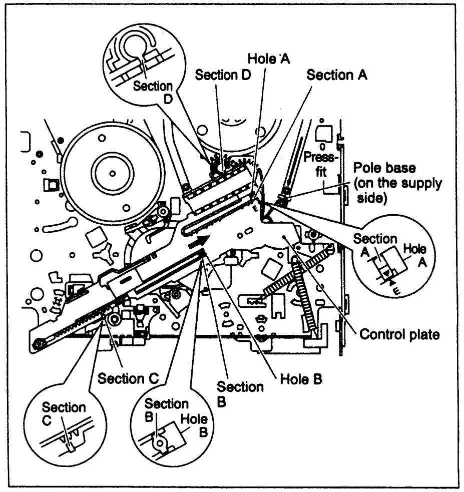

Section D
Hole A
Section D
Section A
Press-fit
Pole base (on the supply side)
Section A
Hole A
E
Control plate
Section C
Section B
Hole B
Section C
Section B
Hole B

Fig. 2-2-25

2.2.16 Loading Arm (on the supply or take-up side) and Loading Arm Gear Shaft

1. How to remove

(1) Remove the loading arm (on the supply side) by loosening screw (A) in Fig.2-2-26.

(2) Remove screw (B) in Fig.2-2-26 and slide the pole base in the loading direction with the spring held on the pole base (on the take-up side). (See Fig.2-2-26)

(3) Pull the spring out of the pole base. Turn the loading arm clockwise through about 45 degrees so that the notch of the loading arm is in alignment with the projection of the loading arm gear shaft and lift it.
Likewise, turn the loading arm counterclockwise through 180 degrees so that the notch is in alignment with the projection and remove the loading arm (on the take-up side). (See Fig.2-2-27)

(4) When removing the loading arm gear shaft, be sure of first removing the screw retaining the drum assembly (on the back side of the loading arm gear shaft). Then remove one screw (C) and remove the loading arm gear shaft by sliding it in the arrow-indicated direction.

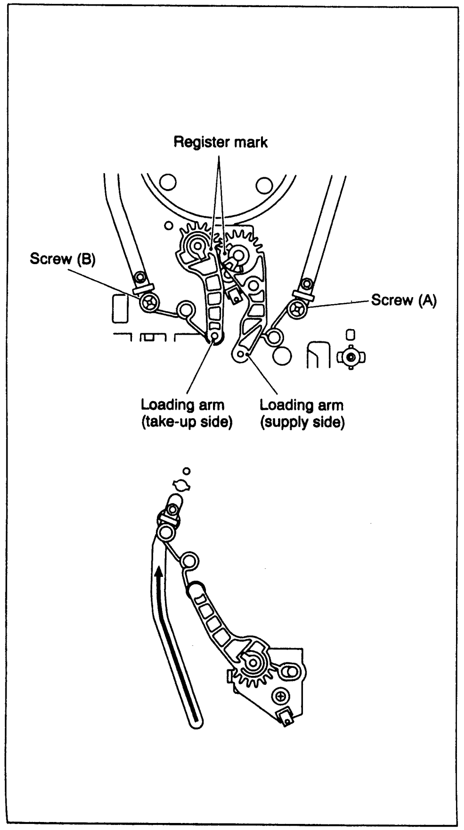


Fig. 2-2-26

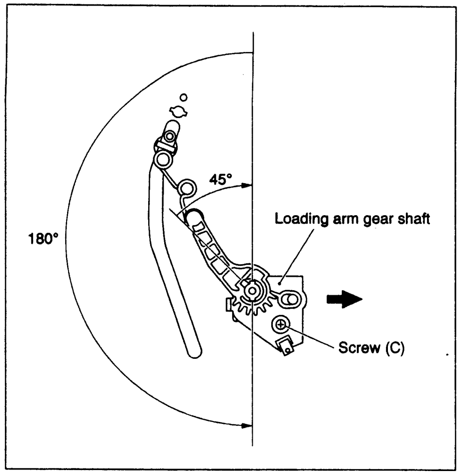


Fig. 2-2-27

2. How to install

(1) Install the loading arm (on the take-up side) as indicated in Fig.2-2-28 and turn it clockwise through 180 degrees so that the loading arm reaches the bottom of the loading arm gear shaft.

(2) Then turn the loading arm (on the take-up side) counterclockwise through 180 degrees. Hang the spring on the pole base and tighten the screw.

(3) Install the loading arm (on the supply side) so that the register mark of the loading arm (on the take-up side) is in alignment with the register mark of the loading arm (on the supply side). Then hang the spring on the pole base and tighten the screw. (See Fig.2-2-26).

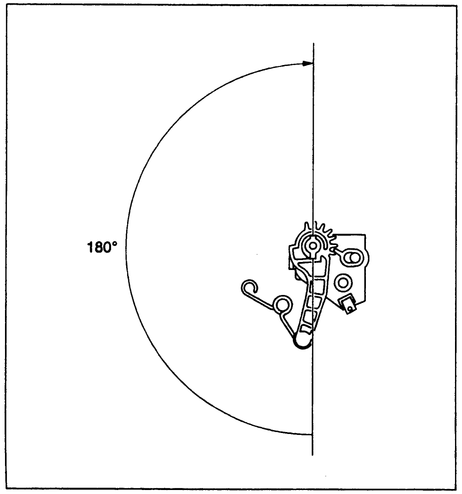


Fig. 2-2-28

2.2.17 Take-up Lever, Take-up Head and Control Plate Guide

(1) Remove the spring of the take-up lever from the main deck.

(2) Remove one lug of the take-up lever from the main deck and pull out the take-up lever and the take-up head together.

(3) Remove one screw (A).

(4) Remove two lugs of the control plate guide from the main deck. Locate the idler arm pin in the center of the R section of the control plate and remove the latter.

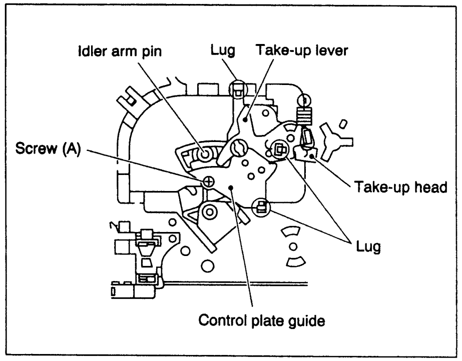


Fig. 2-2-29

2.2.18 Capstan Brake

(1) Move lug A of the capstan brake in the arrow-indicated direction so that it comes into alignment with the notch of the main deck. (See Fig. 2-2-30)

(2) Remove lug B of the capstan brake from the main deck and remove the capstan brake.

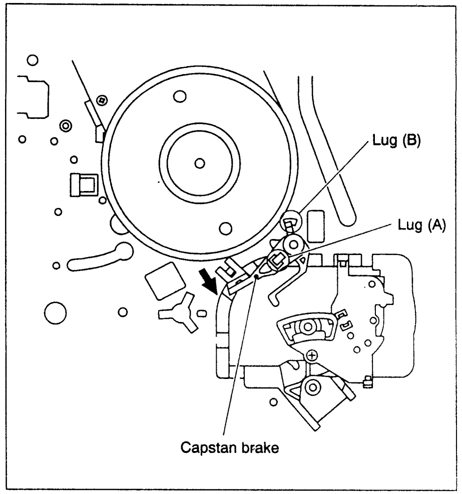


Fig. 2-2-30

2.2.19 Drive Gear and Drive Arm

1. How to remove

(1) Remove the cassette holder assembly. (See 2.2.3 How to remove the cassette holder assembly)

(2) Pull out the drive gear and remove the drive arm.

2. How to install

(1) Insert section A of the drive arm into section B of the main deck.

(2) Insert section ① of drive gear into hole ○ of the drive arm and section ② into hole □. (See Fig. 2-2-31)

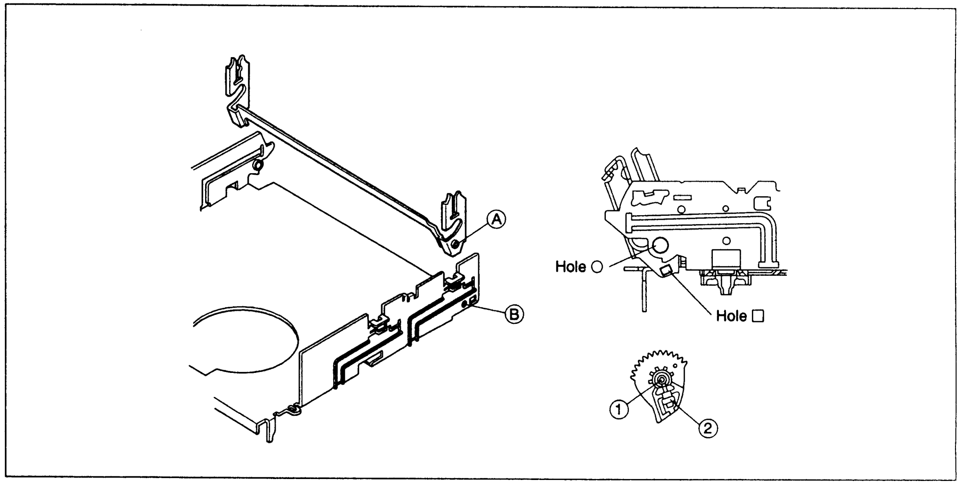


Fig. 2-2-31

2.2.20 Sub Brake (on the take-up side)

(1) Remove the spring attached to the lid guide and sub brake.

(2) Bring lug Ⓐ of the sub brake into alignment with the notch of the main deck.

(3) Remove lugs Ⓑ and Ⓒ of the sub brake from the main deck and remove the sub brake.

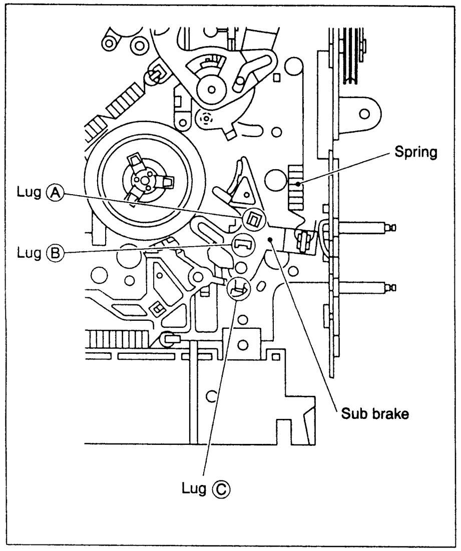

Spring
Lug Ⓐ
Lug Ⓑ
Sub brake
Lug Ⓒ

Fig. 2-2-32

2.2.21 Main Brake (on the take-up side), Reel Disk (on the take-up side) and Main Brake (on the supply side)

(1) Move the main brake (on the take-up side) in the arrow-indicated direction and remove the reel disk (on the take-up side).

(2) Remove the spring attached to the main brake.

(3) Remove lug Ⓐ of the main brake (on the take-up side) and pull out lug Ⓑ after bringing it into alignment with the main deck notch.

(4) Remove lugs Ⓒ and Ⓓ of the main brake (on the supply side) from the main deck and pull them off. (See Fig.2-2-33)

Note: *If the main brake is difficult to remove, press it and hold the adjustment pin from the back side of the main deck when attempting to remove it.*
After the adjustment pin has been removed or the main brake or the reel disk on the supply or take-up side have been replaced, it is required to adjust the main brake torque. See page 2-24 for the detailed adjustment procedures.

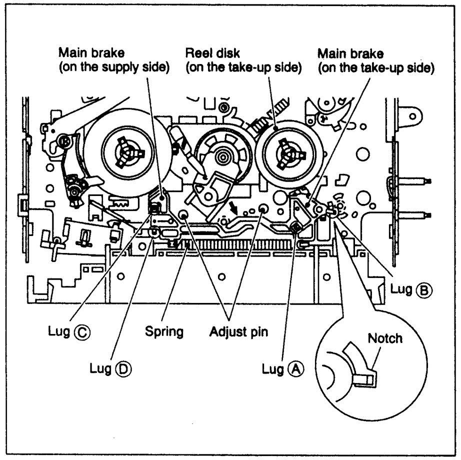

Main brake (on the supply side)
Reel disk (on the take-up side)
Main brake (on the take-up side)
Lug Ⓑ
Notch
Lug Ⓒ
Spring
Adjust pin
Lug Ⓓ
Lug Ⓐ

Fig. 2-2-33

2.2.22 Tension Brake, Reel Disk (on the supply side) and Tension Arm

(1) Remove the three lugs of the tension brake from the main deck and pull them off.

(2) Remove the reel disk (on the supply side) by loosening in the arrow-indicated direction the main brake (on the supply side).

(3) Remove the tension spring on the main deck back side and remove the lugs of the tension arm bearing to pull up and remove the tension arm. (See Fig.2-2-34)

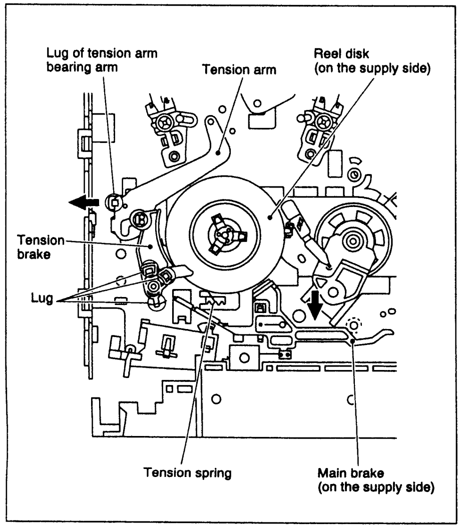

Lug of tension arm bearing arm
Tension arm
Reel disk (on the supply side)
Tension brake
Lug
Tension spring
Main brake (on the supply side)

Fig. 2-2-34

2.2.23 Idler Lever, Idler Arm and Reel Shaft

(1) Remove one lug of the idler lever from the main deck and remove the hook fitted in the idler arm hole by lifting it.

(2) Remove the slit washer and pull out the idler arm.

(3) Turn the reel shaft counterclockwise through 60 degrees and remove it. (See Fig.2-2-35)

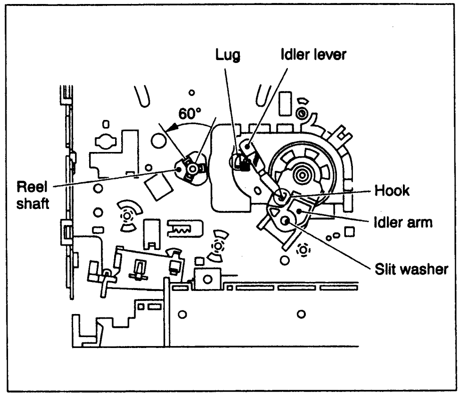

Lug
Idler lever
60°
Reel shaft
Hook
Idler arm
Slit washer

Fig. 2-2-35

2.2.24 Stator Assembly

(1) Remove two screws (A).

(2) Remove the stator assembly by lifting in the arrow-indicated direction (Take care that the brush spring does not jump out).

(3) Remove the flat cable.

(4) After installation, be sure to perform the 3.2.1 PB switching point adjustment according to the electrical adjustment procedure.

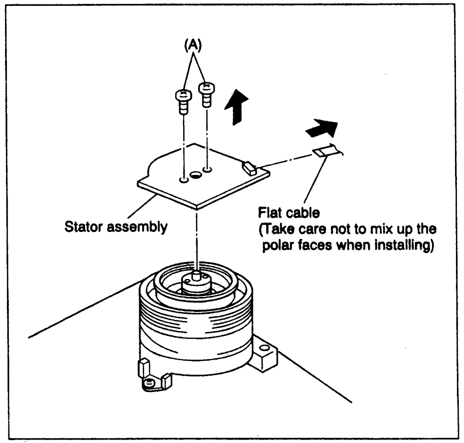

(A)
Stator assembly
Flat cable
(Take care not to mix up the polar faces when installing)

Fig. 2-2-36

2.2.25 Rotor Assembly

(1) Remove the stator assembly.

(2) Remove the two screws (B) and remove the rotor assembly.

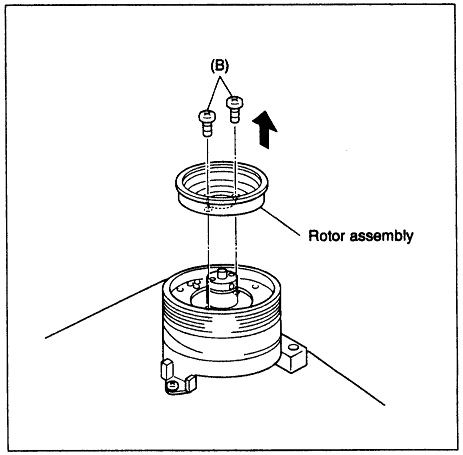

(B)
Rotor assembly

Fig. 2-2-37

Note: *When installing the rotor assembly, note that a normal picture cannot be obtained without ensuring the phase matching as mentioned below.*

(3) Match the phases of the upper drum and the rotor assembly as indicated in Fig.2-2-38.

(4) Place the upper drum hole (a) over the rotor assembly holes (b) (with three holes to be aligned) and tighten the two screws (B). (See Fig.2-2-38)

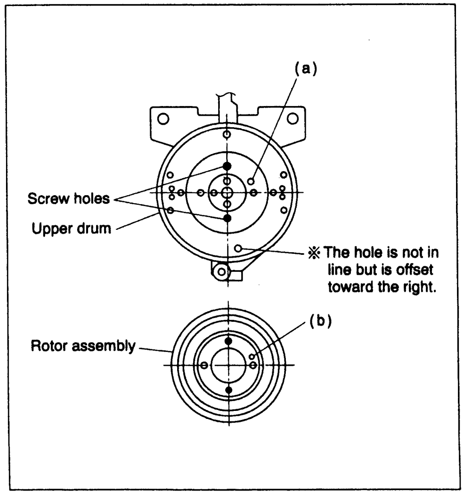

(a)
Screw holes
Upper drum
※The hole is not in line but is offset toward the right.
(b)
Rotor assembly

Fig. 2-2-38

2.2.26 Upper Drum Assembly

1. How to remove

(1) Remove the stator assembly and rotor assembly. (See Fig. 2.2.36 and Fig. 2.2.37)

(2) Loosen the screw of the collar assembly using a 1.5 mm hexagonal wrench and remove the collar assembly. Also remove the brush, spring and cap at one time.

(3) Remove the upper drum assembly and remove the washer using tweezers.

Note: ***When replacement is required, control the up-down movement of the brush. Never apply grease.***

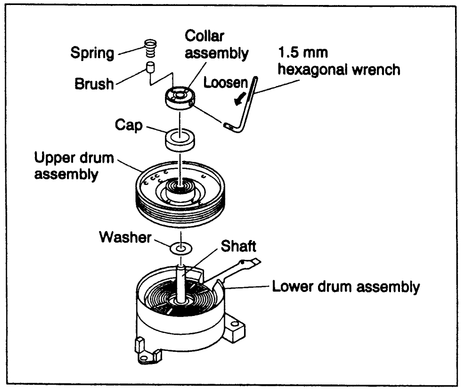


Fig. 2-2-39 Upper drum assembly-1

2. How to install

(1) Clean coil parts of the lower drum assembly and the newly installed upper drum assembly with an air brush in advance. (See Fig.2-2-40).

(2) Install a new washer and upper drum assembly on the drum shaft. (See Fig.2-2-39)

Note: ***When replacing the upper drum assembly, replace it the together with the washer.***

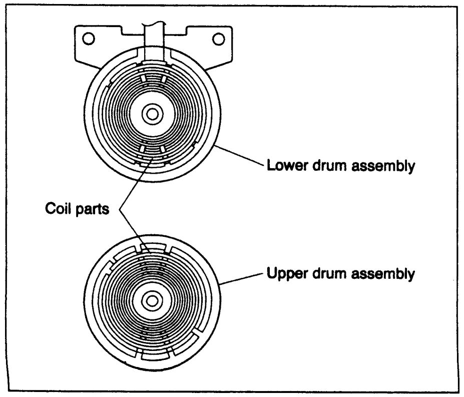


Fig. 2-2-40

(3) Position the collar assembly as indicated in Fig.2-41 while controlling its up- down movement.

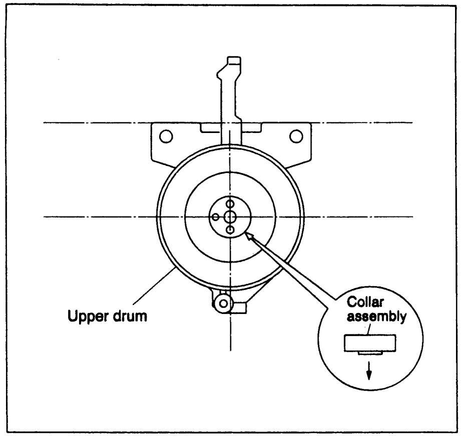


Fig. 2-2-41

(4) Secure the collar assembly in position with a hexagonal wrench while pressing its top with the fingers.

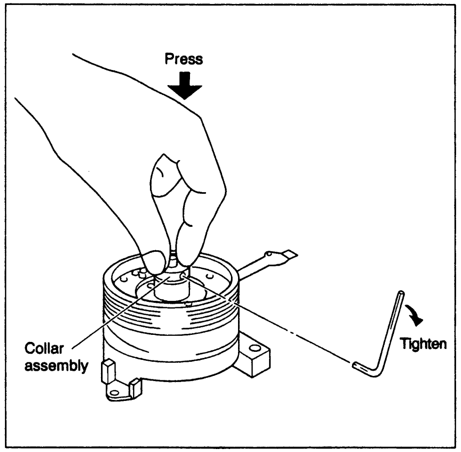


Fig. 2-2-42

(5) After installation, gently turn the upper drum with your hand to make sure that it turns normally.

(6) Install the rotor assembly and stator assembly according to Fig. 2.2.36 and Fig. 2.2.38.

(7) When installation is complete, clean the upper drum assembly and lower the drum assembly and carry out the following adjustments.

- PB switching point adjustment
- Slow tracking adjustment
- Compatibility adjustment (Be sure to check for compatibility for the LP mode.)

2.3 MAJOR PARTS INSTALLATION (PHASE MATCHING BETWEEN MECHANICAL PARTS)

2.3.1 Before Assembly of the Parts

The mechanism of this unit is closely linked with the rotary encoder and system controller circuits.
Since the system controller detects the status of mechanical operation in response to phases of the rotary encoder (internal switch positions), the mechanism may not operate properly unless such parts as the rotary encoder, control plate, loading arm assembly, control cam, cassette gear, limit gear, relay gear and drive gear are installed in their correct positions.
Especially, this model is not provided with any cassette housing assembly, so that cassette loading and unloading must be accomplished by operation of the cassette holder assembly. The latter is in turn driven by such parts as drive gear, relay gear and limit gear. Exercise enough care, therefore, to have the phases of all this gear matching one another.
Perform the installation of major parts (including phase matching) in the mechanism assembling mode as in the previous section.

2.3.2 Loading Arm Assembly (on the Supply or Take-up Side)

(1) Return the pole base assembly to the foremost position in the unloading direction.

(2) Install the loading arm assembly so that the register mark on the gear of the supply side loading arm is in alignment with the one on the take-up side loading arm as indicated in Fig. 2-3-1.
See 2.2.16 "2. How to install" of the foregoing section for details of installation.

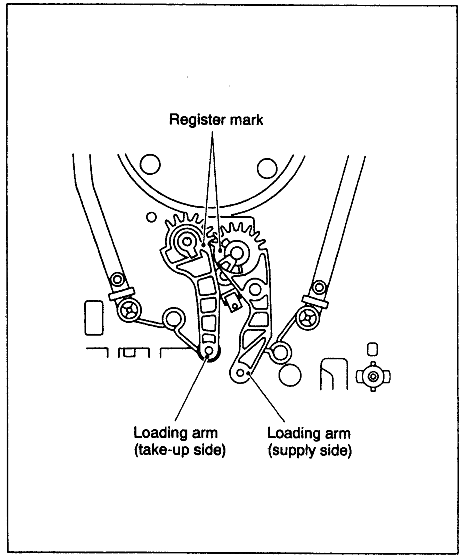


Fig. 2-3-1

2.3.3 Control Plate

(1) With register marks on the both loading arm assemblies in alignment, install the control plate so that the mark ▼ on the loading arm gear shaft is in alignment with mark E of the control plate. (See Fig.2-3-2)
See 2.2.15 "2. How to install" of the foregoing section for details of installation.

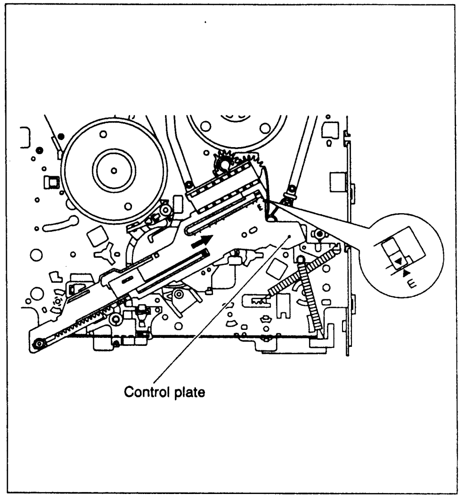


Fig. 2-3-2

2.3.4 Rotary Encoder

(1) Make sure that the mark E of the control plate is in alignment with the mark ü+ of the loading arm gear shaft and bring the register marks on the rotary encoder into alignment as indicated in Fig.2-3-3.

(2) Turn over the rotary encoder with its register marks kept in alignment and install it by fitting on the shaft of the rotary encoder guide and the positioning pin.

(3) Tighten the screw (A) to complete the installation.

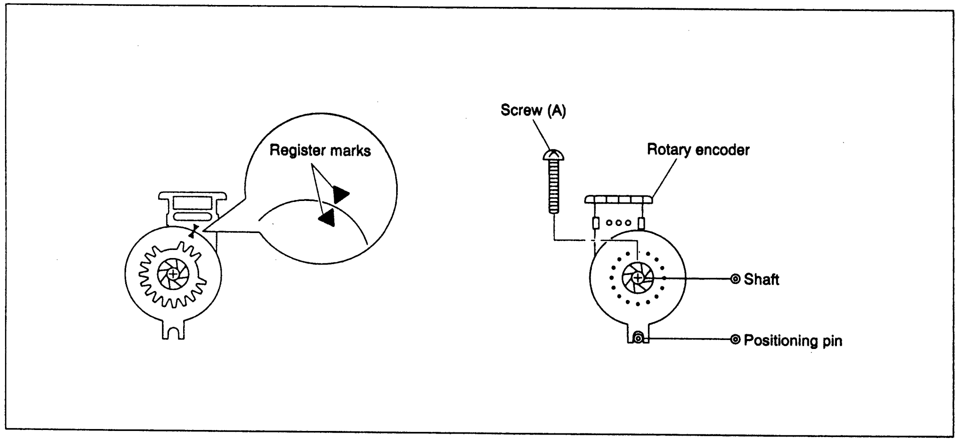


Fig. 2-3-3

2.3.5 Control Cam, Cassette Gear and Link Lever

(1) Install the control cam as indicated in Fig.2-3-4 making sure of the front and back side alignment.
Note here that the register hole of the control cam is in alignment with and allows passage through the register hole of the main deck. Perform fine-adjustment by turning the worm gear.

(2) Install the cassette gear by pushing it until it is locked with a clicking sound. (See Fig.2-3-4)

(3) Insert section (A) of the link lever into section (B) of the control plate as shown in Fig.2-3-5.

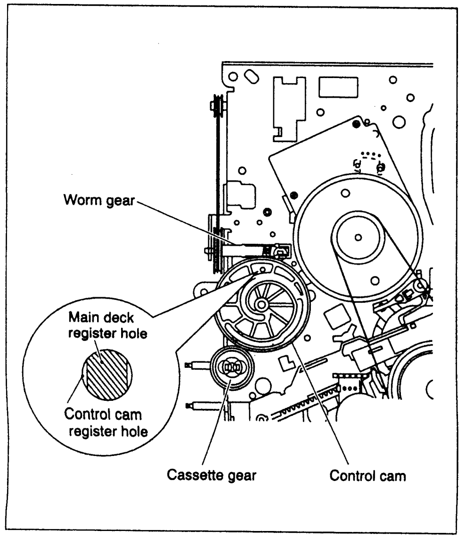


Fig. 2-3-4

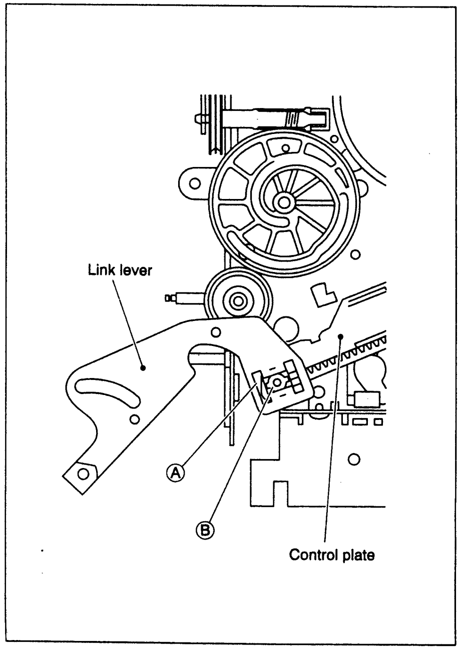


Fig. 2-3-5

(4) Turn the link lever clockwise and mount it on the control cam center shaft Ⓐ and the control cam left-side shaft Ⓑ. (See Fig.2-3-6).

(5) Fasten the slit washers at two points Ⓐ and Ⓑ.

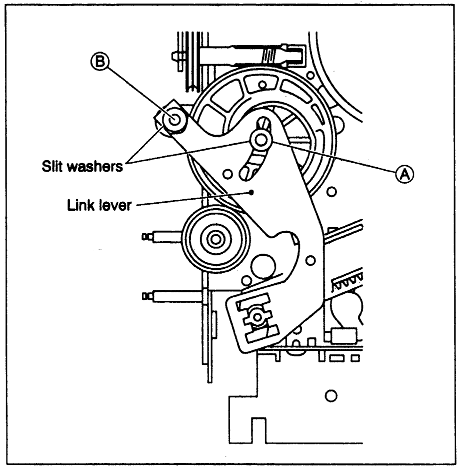


Fig. 2-3-6

2.3.6 Relay Gear, Limit Gear and Drive Gear

(1) Install the limit gear so that the notch at its outer circumference is in alignment with the register hole of the main deck.(See Fig.2-3-7)

(2) Install so that the notch at the outer circumference of the relay gear is in alignment with the notch of the main deck, and at the same time, that the hole A of the relay gear is in alignment with hole A of the limit gear and hole B of the relay gear with hole B of the drive gear. (See Fig.2-3-7)

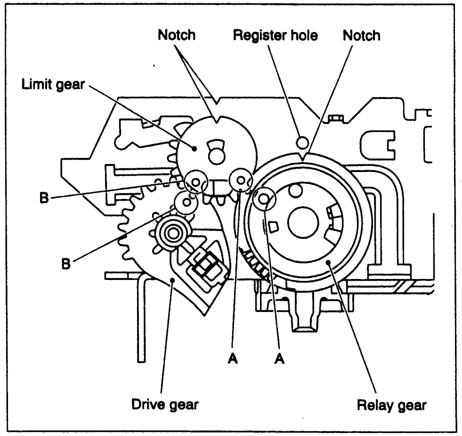


Fig. 2-3-7

2.4 COMPATIBILITY ADJUSTMENT

Notes:
- *Although compatibility adjustment is very important, it is not necessary to perform this as part of the normal servicing work. It will be required when you have replaced the audio control head, drum assembly or any part of the tape transport system.*
- *To avoid any damage to the alignment tape while performing the compatibility adjustment, get a separate cassette tape (for recording and play back) ready to be used for checking the initial tape running behavior.*

2.4.1 Checking/Adjustment of FM Waveform Linearity

(1) Connect the oscilloscope to TP106(PB FM/COL) of the main board assembly and to TP111(D.FF) of the main board assembly for external sync connection.

(2) Playing the alignment tape MHPE, observe the FM waveform.

(3) Press the channel buttons (+) and (–) buttons simultaneously during playback to enter the manual tracking mode (This also brings tracking to the center.)

(4) Make sure that there is no significant level drop of the FM waveform caused by the tracking operation, with its generally parallel and linear variation ensured. Perform the following adjustments when required. (Fig.2-4-1)

(5) Slightly loosen the set screw under the pole base assembly with a 1.25 mm hexagonal wrench (Take care not to loosen too much). (Fig.2-4-2)

(6) Reduce the FM waveform while pressing the channel buttons (+, –) during playback. If a drop in level is found on the left side as shown in Fig.2-4-3, turn the guide roller of the pole base assembly (supply side) with the roller driver (PTU94002) to make the FM waveform linear.
If a drop in level is on the right side, likewise turn the guide roller of the pole base assembly (take-up side) with the guide roller to make it linear. (Fig.2-4-3)

(7) Then play MHPE-L and make sure that the FM waveform varies in parallel and linearly with the tracking operation. When required, perform fine-adjustment of the guide roller of the pole base assembly (supply or take-up side).

(8) After adjustment, tighten the set screw under the pole base assembly. (Take care not to tighten too much)

(9) After tightening the set screw, play the alignment tape MHPE and MHPE-L again to make sure that the FM waveform has correct variation.

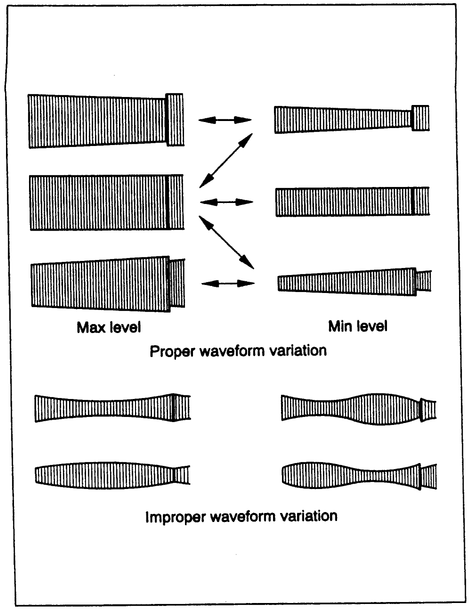

Max level
Min level
Proper waveform variation
Improper waveform variation

Fig. 2-4-1

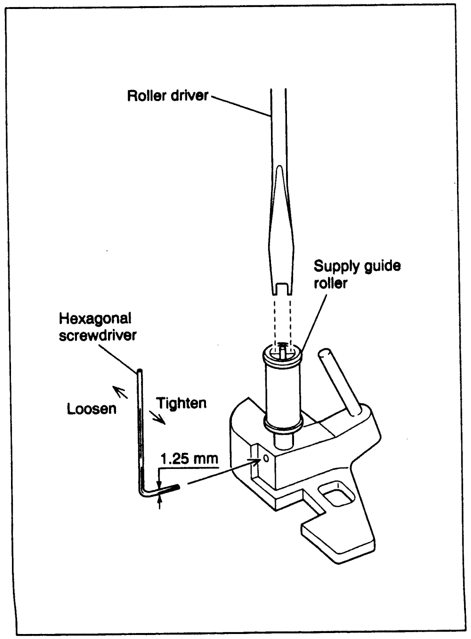

Roller driver
Supply guide roller
Hexagonal screwdriver
Loosen
Tighten
1.25 mm

Fig. 2-4-2

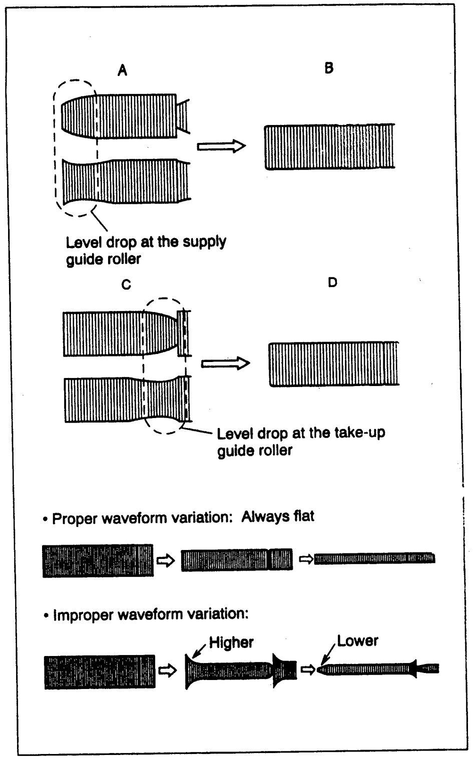

A
B
Level drop at the supply guide roller
C
D
Level drop at the take-up guide roller
• Proper waveform variation: Always flat
• Improper waveform variation:
Higher
Lower

Fig. 2-4-3

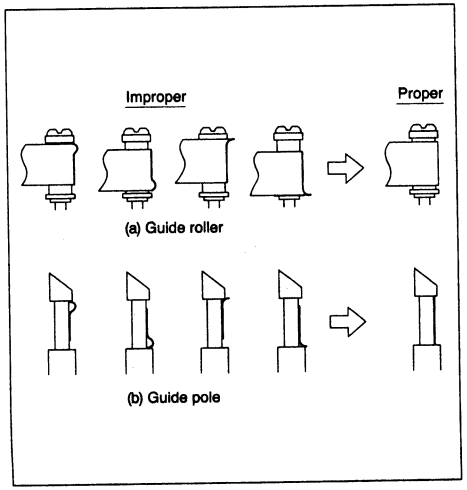

Improper
Proper
(a) Guide roller
(b) Guide pole

Fig. 2-4-4

2.4.2 Checking/Adjustment of the Height and Tilt of the Audio Control Head

Note: *Set a temporary level of the height of the A/C head in advance to make the adjustment easier. (See Fig.2-2-14)*

(1) Connect CH-1 of the oscilloscope to AUDIO OUT and CH-2 to TP4001 (CTL P) of the main board and observe the waveforms on both channels in the ALT mode.

(2) Play the alignment tape MHPE and adjust it by turning screws (1), (2) and (3) little by little until the waveform of both the audio output signal and the control pulse reach maximum. Screw (1) and screw (3) are for adjustment of tilt and screw (2) for azimuth.

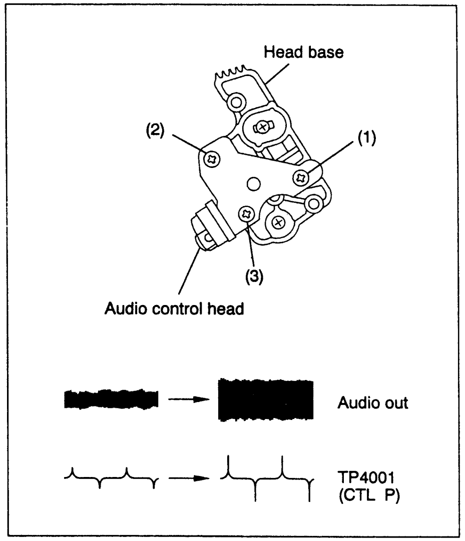

Head base
(2)
(1)
(3)
Audio control head
Audio out
TP4001
(CTL P)

Fig. 2-4-5

2.4.3 Checking/Adjustment of the Audio Control Head Phase (X-Value)

(1) Connect the oscilloscope to TP106(PB FM/COL) of the main board assembly and to TP111(D.FF) of the main board assembly for external sync connection.

(2) Play the alignment tape MHPE and observe the FM waveforms.

(3) Press the channel buttons (+) and (–) buttons simultaneously during playback to enter the manual tracking mode (This also brings tracking to the center.)

(4) Loosen screws (4) and (5) so that the A/C head position bit (PTU94010) is set as indicated in Fig.2-4-6.

(5) Turn the A/C head position and first move the audio control head fully up to the capstan head. Then gradually return the audio control head toward the drum and stop it where the FM waveform reaches its maximum for the first time. Then tighten screw (4) temporarily.

(6) Then play the alignment tape MHPE-L.

(7) Press the channel buttons (+) and (–) buttons simultaneously during playback to enter the manual tracking mode (This also brings the tracking to the center.)

(8) Perform the tracking operation and make sure that the FM waveform is at its maximum.

(9) If it is not at maximum, loosen the temporarily tightened screw (4) and turn the A/C head position bit to bring the audio control head to a position, around where the waveform reaches its maximum for the first time. Then tighten screws (4) and (5).

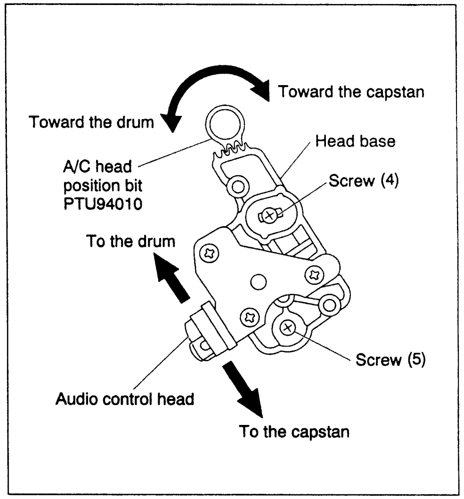

Toward the drum
Toward the capstan
Head base
A/C head position bit PTU94010
Screw (4)
To the drum
Screw (5)
Audio control head
To the capstan

Fig. 2-4-6

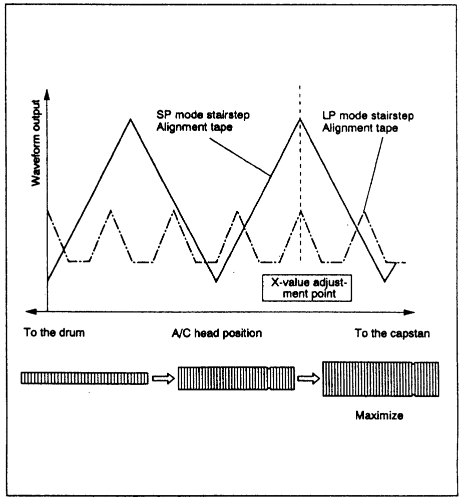


Fig. 2-4-7

2.4.4 LP mode Tracking Preset

Note: *Set the remote control cable of the video recorder to A mode.*
(The unit set in B mode does not accept the remote control cable of the presetting unit.)

(1) Connect the oscilloscope to TP106(PB FM/COL) of the main board assembly and to TP111(D.FF) of the main board assembly for external sync connection.
(2) Playing the alignment tape MHPE-L and observing the FM waveform, make sure that the auto tracking operation is complete.
(3) Press the button "D" of the presetting unit twice.
(4) Make sure that the MHPE-L is not ejected.
(5) If ejected, again perform the phase (X-value) adjustment of the audio control head.

2.4.5 Checking/Adjustment of the Tension Pole

(1) Check the back tension cassette gauge (PUJ48076-2) to make sure that the indicator points to 29 - 46 g-cm.
(2) If the indicated value is outside this range, carry out the following adjustment steps.
  1) Select the mechanism servicing mode. (See 1.5 MECHANISM SERVICE MODE)
  2) While in the Play mode, turn the adjustment pin with a straight-slot screwdriver. (See Fig.2-4-8).

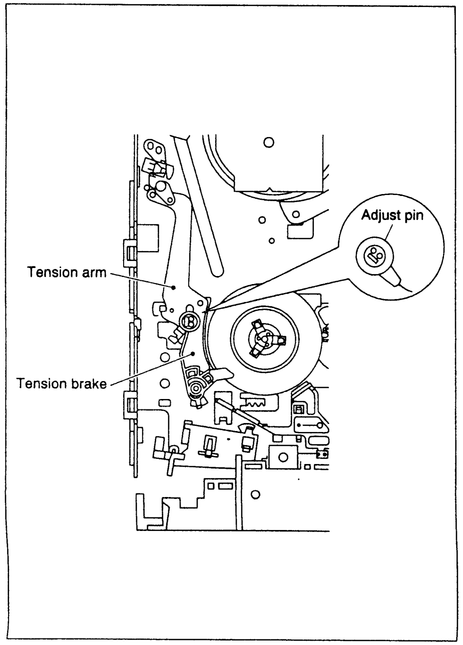


Fig. 2-4-8

2.4.6 Adjustment of the Tension Stud

(1) Adjust so that the left side of the tension stud is on the extension of the notch line of the main deck as indicated in Fig.2-4-9.

Note: ***Adjustment is not usually necessary for the tension stud. Perform this adjustment only when it is out of position.***

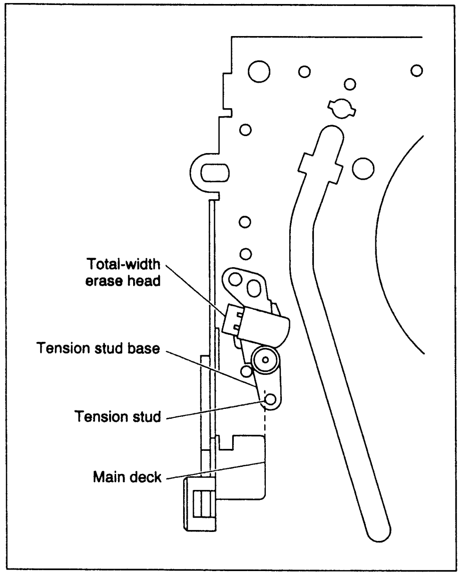


Fig. 2-4-9

2.4.7 Main Brake Torque Adjustment

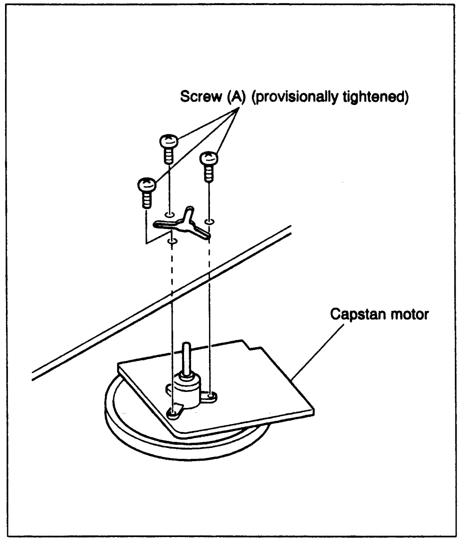
Note: ***Adjustment of the main brake torque is required after the adjustment pin has been removed or the main brake or the reel base on the supply or take-up side have been replaced, removed or attached.***

(1) Rotate the pulley of the loading motor by hand to align the mark ▼ on the loading arm gear shaft with the ST marking on the control plate (i.e. set to the STOP mode position).
(2) Insert a torque gauge (PUJ48075-2) into the reel base on the side to be played, hold the torque gauge lightly, rotate it clockwise when measuring the supply side torque or counterclockwise when measuring the take-up side torque, and read the value indicated at the moment the reel base starts to slip.
(3) Make sure that the main brake torque values on the supply and take-up sides are both between $39.^2$ — $78.^4$ x 10^{-3} N-m (400 — 800 gf-cm). If the value is outside the specified range, adjust to the specified value by rotating the adjustment pin.
If an adjustment by using the adjustment pin is not possible, replace the main brake.

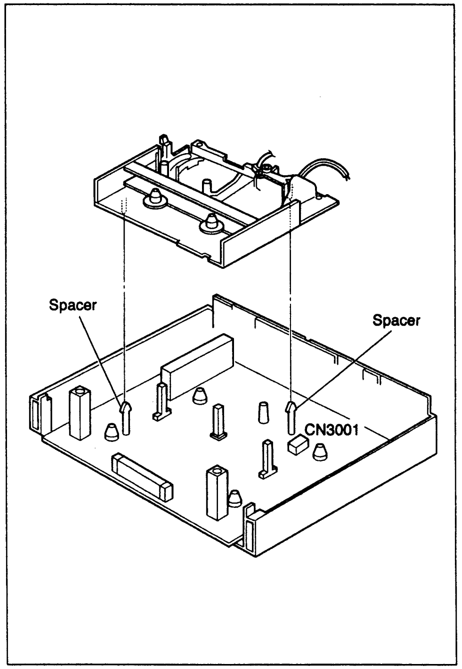
How to Mount the Capstan Motor (Centering the Mounting Position)

When the capstan motor has once been removed and then reinstalled out of the initial correct position in the rotational direction, the capstan motor current may be unstable during operation in high or low temperatures. This may result in greater Wow & Flutter and occasionally in power breakdown because of current over - load. Install the capstan motor while following the procedure given below.
(The capstan motor is centrally located when the unit is shipped from the factory.)

1. Provisionally tighten the three screws (A) securing the capstan motor.



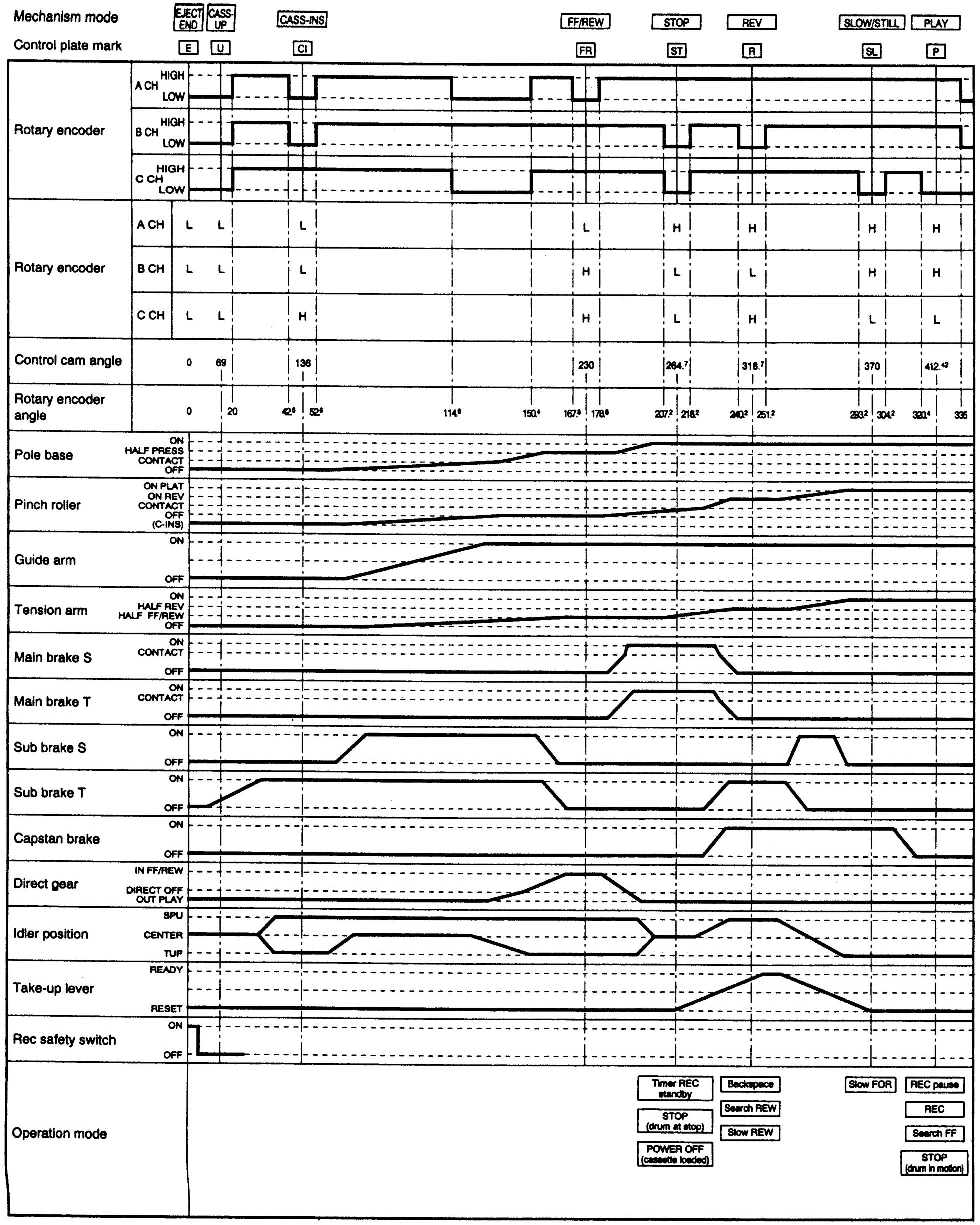
2. Install the mechanism to which the capstan motor is provisionally fastened on the bottom chassis which incorporates the Main board assembly. (No need to tighten the screws for mounting the mechanism)
Make sure that all the connectors for the mechanism and the Main board are correctly installed.



3. Securely tighten the three screws (A), especially making sure that the connector CN3001 of the capstan motor is correctly mounted.

Note: ***When the capstan motor has been replaced with a new one, perform recording in the LP mode for at least 2 minutes at normal temperatures immediately before starting the FF/REW or SEARCH operations (Aging).***

Mechanism Timing Chart


Mechanism mode
EJECT END
CASS-UP
CASS-INS
FF/REW
STOP
REV
SLOW/STILL
PLAY
Control plate mark
E
U
CI
FR
ST
R
SL
P
Rotary encoder
A CH
B CH
C CH
HIGH
LOW
Rotary encoder
A CH: L L L L H H H H
B CH: L L L H L L H H
C CH: L L H H L H L L
Control cam angle
0
69
136
230
264.7
318.7
370
412.42
Rotary encoder angle
0
20
42^6
52^6
114^8
150^4
167^8
178^8
207^2
218^2
240^2
251^2
293^2
304^2
320^4
335
Pole base
ON
HALF PRESS
CONTACT
OFF
Pinch roller
ON PLAT
ON REV
CONTACT
OFF
(C-INS)
Guide arm
ON
OFF
Tension arm
ON
HALF REV
HALF FF/REW
OFF
Main brake S
ON
CONTACT
OFF
Main brake T
ON
CONTACT
OFF
Sub brake S
ON
OFF
Sub brake T
ON
OFF
Capstan brake
ON
OFF
Direct gear
IN FF/REW
DIRECT OFF
OUT PLAY
Idler position
SPU
CENTER
TUP
Take-up lever
READY
RESET
Rec safety switch
ON
OFF
Operation mode
Timer REC standby
STOP (drum at stop)
POWER OFF (cassette loaded)
Backspace
Search REW
Slow REW
Slow FOR
REC pause
REC
Search FF
STOP (drum in motion)

SECTION 3
ELECTRICAL ADJUSTMENT

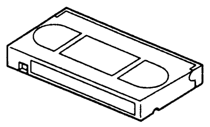
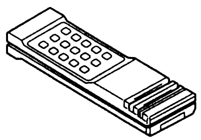
3.1 PRECAUTION

Electrical adjustment are required after replacing circuit components and certain mechanical parts. It is important to perform these adjustments only after all repairs and replacements have been completed. Also do not attempt these adjustments unless the proper equipments is available.

3.1.1 Required test equipment

① Colour television or monitor
② Oscilloscope: wide-band,dual-trace,triggered delayed sweep
③ Frequency counter
④ Digital voltmeter
⑤ Signal generator: RF/IF sweep/maker
⑥ Signal generator: PAL/SECAM colour bar, stairstep
⑦ Recording tape
⑧ Numeric-key remote controller(provided)

3.1.2 Required adjustment tools

Alignment tape (SP,stairstep) MHPE	Presetting unit PTU94008
	

> **Note:**
>
> ***Be sure to remove R3238 (MAIN PWB ASS'Y) when replacing the system controller IC (MAIN PWB ASS'Y IC3001) and the EEPROM (MAIN PWB ASS'Y IC3004).***

3.1.3 Colour bar signal,colour bar pattern

- PAL colour bar signal

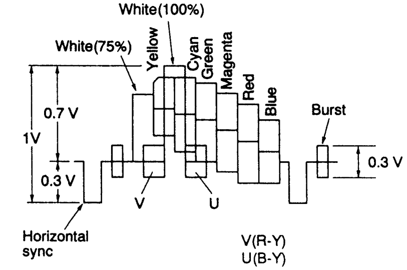

White(100%)
White(75%)
Yellow
Cyan
Green
Magenta
Red
Blue
Burst
0.7 V
1V
0.3 V
0.3 V
V
U
Horizontal sync
V(R-Y)
U(B-Y)

Fig.3-1-1 PAL colour bar signal waveform

- PAL colour bar pattern

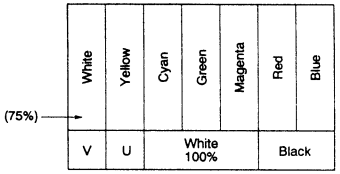

White
Yellow
Cyan
Green
Magenta
Red
Blue
(75%)
V
U
White 100%
Black

Fig.3-1-2 PAL colour bar pattern

3.2 SERVO CIRCUIT

Notes:
- *Unless otherwise specified,all measurement point and adjustment parts are located on the MAIN BOARD.*
- *Set VCR to the mode A by remote controller.*
- *Use only buttons "O", depressing other buttons during adjustment may cause adjustment errors.*

3.2.1 PB switching point

Signal	•Alignment tape [MHPE],Stairstep
Mode	•PB
Equipment	•Oscilloscope
Measurement point	•VIDEO OUT TERMINAL
Trigger slope (-)	•TP111(DRUM FF)
Adjustment tool	•Presetting unit [PTU94008]
Specification	•6.5 ± 0.5H

(1) Connect an oscilloscope to VIDEO OUT TERMINAL and external trigger from TP111 (negative slope).
(2) Playback the stairstep signal of the alignment tape.
(3) Press the "O" button of the presetting unit.
(4) The adjustment is performed automatically.
Once the adjustment is performed, the VCR will go into the STOP mode.

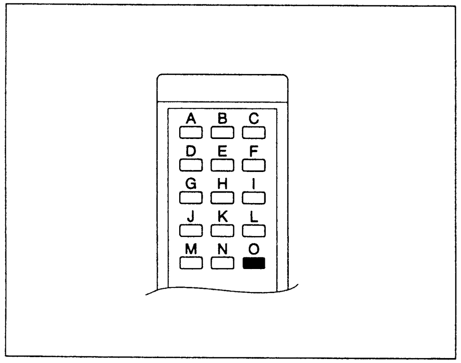


Fig.3-2-1 Presetting unit

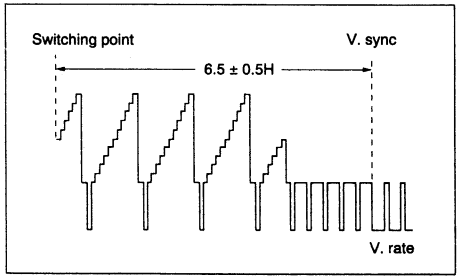


Fig.3-2-2 PB switching point

3.2.2 Slow tracking preset

Signal	•Colour bar (PAL, NTSC)
Mode	•LP: PAL REC → PB(SLOW) •EP: NTSC
Equipment	•TV-Monitor
Adjustment tool	•Presetting unit [PTU94008]
Specification	•Minimum noise

Note : *Set VCR to the mode A by remote controller. Use only buttons "B" and "C", depressing other buttons during adjustment may cause adjustment errors.*

(1) Record a PAL colour bar signal in the LP mode.
(2) Playback recorded signal on the FWD slow mode.
(3) Observe the display on the TV monitor and adjust for optimum noise condition (best tracking) by depressing "B" or "C" buttons of the presetting unit.
(4) Depress the STOP button.
(5) Confirm that the bar noise is not visible on the TV monitor in the slow mode.
(6) Repeat steps (1) to (5) in the NTSC mode.

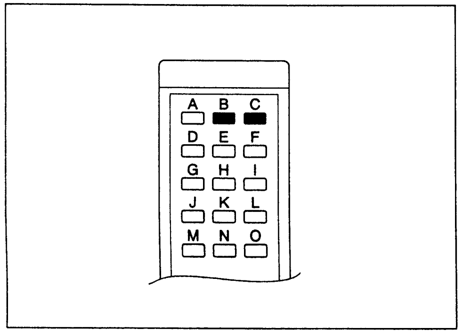


Fig.3-2-3 Presetting unit

3.3 VIDEO CIRCUIT

Notes:
- *Unless otherwise specified,all measurement point and adjustment parts are located on the MAIN BOARD.*
- *Set VCR to the mode A by remote controller.*

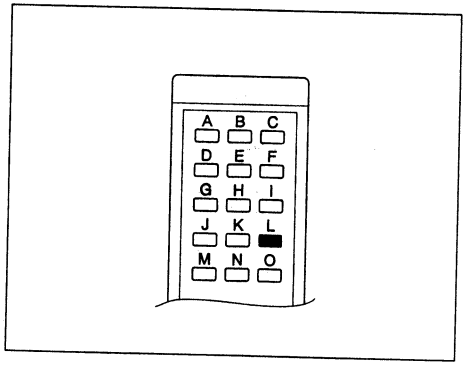


Fig.3-3-1 Presetting unit

3.3.1 Auto picture

Signal	•Monoscope
Mode	•REC then PB •SP/LP: PAL •SP/EP: NTSC •BEST: OFF
Adjustment tool	•Presetting unit[PTU94008]
Specification	•STOP mode

(1) Set B.E.S.T feature to OFF on MENU screen.
(2) Record a monoscope signal in the SP mode.
(3) Playback the recorded signal.
(4) Press the "L" button of the presetting unit during playback.
(5) Confirm that VCR will go into the STOP mode.
(6) Repeat steps (3) to (5) in the LP mode.
(7) Repeat steps (2) to (6) in the NTSC mode.

3.4 SYSCON CIRCUIT

Notes:
- *Unless otherwise specified,all measurement point and adjustment parts are located on the MAIN BOARD.*
- *When perform this adjustment,remove the MECHANISM assembly.*

3.4.1 Timer clock

Signal	•No signal
Mode	•EE
Equipment	•Frequency counter
Measurement point	•IC3301 3PIN
Adjustment part	•C3314 (TIMER CLOCK)
Specification	•16384.000 ± 0.01638 Hz [61.03515 ± 0.00006 μsec]

(1) Connect the Frequency Counter to Pin No.3 of the IC3301 and GND.
(2) Connect Pin No.49 to GND.
(3) Short-circuit both ends of the C3015 once to reset the IC3301.
(4) Disconnect Pin No. 49, which was connected to GND at Step (2).
(5) Adjust the C3314 trimmer capacitor so that the output from Pin No.3 of thr IC3301 falls within the 16384.000 ± 0.01638 Hz (61.03515 ± 0.00006 μsec.) range.

3.5 ON SCREEN CIRCUIT

Notes: • *Unless otherwise specified, all measurement point and adjustment parts are located on the MAIN BOARD.*
• *Set VCR to the mode A by remote controller.*

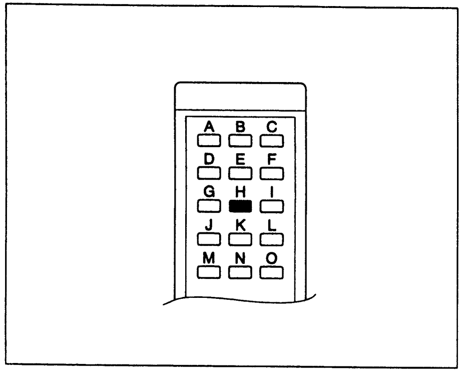

A
B
C
D
E
F
G
H
I
J
K
L
M
N
O

Fig.3-5-1 Presetting unit

3.5.1 Character position

Signal	• No signal
Mode	• EE
Equipment	• TV-monitor
Adjustment tool	• Presetting unit
Specification	• Character centre

(1) Press the MENU button and display the on screen character.
(2) Press "H" button on the presetting unit.
(3) Adjust CH "+" or "–" button so that the character is centre position.
(4) Press the OK button on remote controller to change the indications of "0E" and "0F" on the FDP.
(5) Press "H" button on the presetting unit again to return to normal mode.

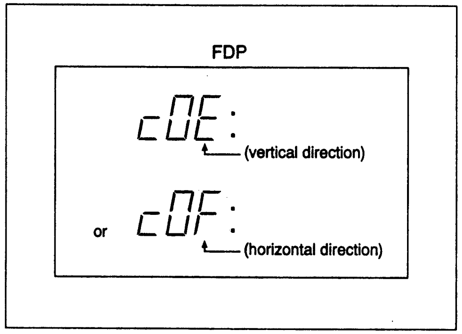

FDP
c0E:
(vertical direction)
or
c0F:
(horizontal direction)

Fig.3-5-2 FDP

SECTION 4
CHARTS AND DIAGRAMS

NOTES OF SCHEMATIC DIAGRAM

Safety precautions
The Components Identified by the symbol ⚠ are critical for safety. For continued safety, replace safety critical components only with manufacturer's recommended parts.

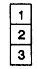
1. Units of components on the schematic diagram

Unless otherwise specified.
1) All resistance values are in ohm, 1/6 W, 1/8 W (refer to parts list).
Chip resistors are 1/16 W.
K: KΩ (1000Ω), M: MΩ (1000KΩ)
2) All capacitance values are in µF, (P: PF).
3) All inductance values are in µH, (m: mH).
4) All diodes are 1SS133, MA165 or IN4148M (refer to parts list).

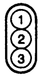
2. Indications of control voltage

AUX : Active at high
$\overline{\text{AUX}}$ or AUX(L) : Active at low

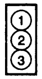
3. Interpreting Connector Indications



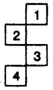
Removable connector



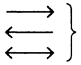
Wire soldered directly on board



Non-removable Board connector



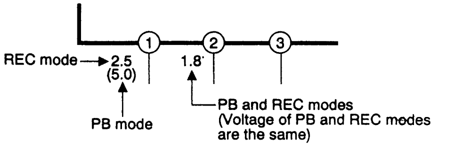
Board to Board



Connected pattern on board
The arrows indicate signal path

4. Voltage measurement

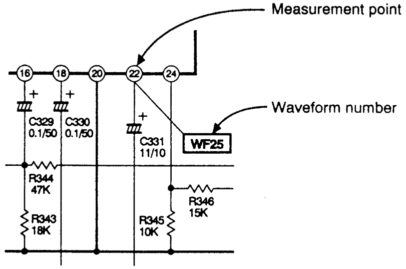
1) Video circuits
REC : Colour bar signal in SP mode, normal VHS mode
PB : Alignment tape, colour bar SP mode, normal VHS mode
— : Unmeasurable or unnecessary to measure
2) Audio circuits
REC : 1KHz, –8 dBs sine wave signal in SP mode, Normal VHS mode
PB : REC then playback it
3) Movie Camera circuits
Measured using a correctly illuminated gray scale or colour bar test charts in the E-E mode
4) Indication on schematic diagram
Voltage Indications for REC and PB mode on the schematic diagram are as shown below.


REC mode
2.5
(5.0)
1.8
1
2
3
PB mode
PB and REC modes
(Voltage of PB and REC modes are the same)

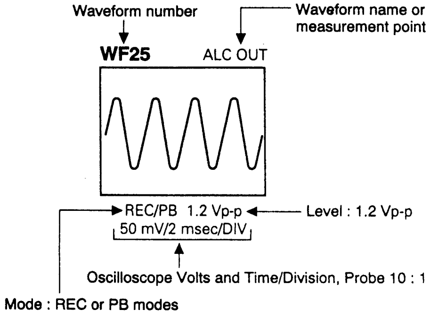
Note: If the voltages are not indicated on the schematic diagram, refer to the voltage charts.

5. Waveform measurement

1) Video circuits
REC : Colour bar signal in SP mode, normal VHS mode
PB : Alignment tape, colour bar SP mode, normal VHS mode
2) Audio circuits
REC : 1KHz, –8 dBs sine wave signal in SP mode, normal VHS mode
PB : REC then playback it
3) Movie Camera circuits
Measured using a correctly illuminated gray scale or colour bar test chatrs in the E-E mode
4) Indication on schematic diagram
Waveform indications on the schematic diagram are as shown below.


Measurement point
Waveform number
16
18
20
22
24
C329 0.1/50
C330 0.1/50
C331 11/10
WF25
R344 47K
R343 18K
R345 10K
R346 15K

5) Waveform indications


Waveform number
Waveform name or measurement point
WF25
ALC OUT
REC/PB 1.2 Vp-p
Level : 1.2 Vp-p
50 mV/2 msec/DIV
Oscilloscope Volts and Time/Division, Probe 10 : 1
Mode : REC or PB modes

6. Signal path Symbols

The arrows indicate the signal path as follows.

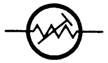
⇨ Playback signal path
➡ Playback and recording signal path
➡ Recording signal path
(including E-E signal path)
⇨▷ Capstan servo path
➡▶ Drum servo path

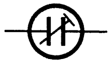
(Example)

⇨ R-Y Playback R-Y signal path
➡ Y Recording Y signal path

7. Indication of the parts for adjustments

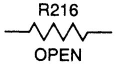
The parts for the adjustments are surrounded with the circle as shown below.





8. Indication of the parts not mounted on the circuit board

"OPEN" is indicated by the parts not mounted on the circuit board.



CIRCUIT BOARD NOTES

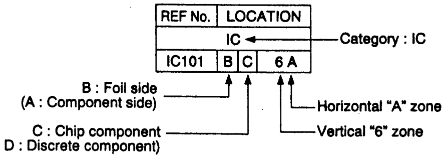
1. Foil and Component sides

1) Foil side (B side) :
Parts on the foil side seen from foil face (pattern face) are indicated.

2) Component side (A side) :
Parts on the component side seen from component face (parts face) indicated.

2. Parts location guides

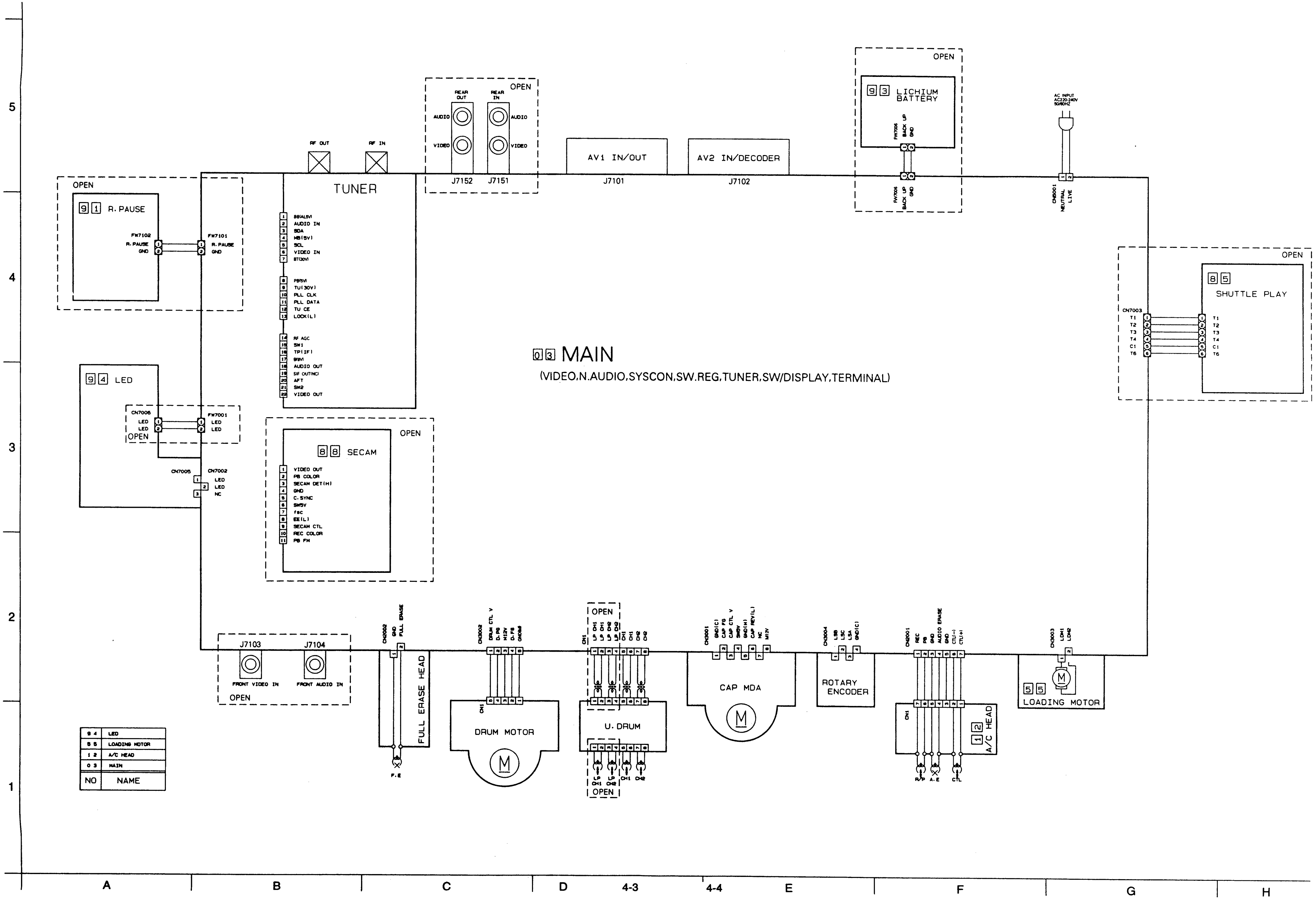
Parts location are indicated by guide scale on the circuit board.


REF No.
LOCATION
IC
Category : IC
IC101
B
C
6 A
B : Foil side
(A : Component side)
C : Chip component
D : Discrete component)
Horizontal "A" zone
Vertical "6" zone

Note:

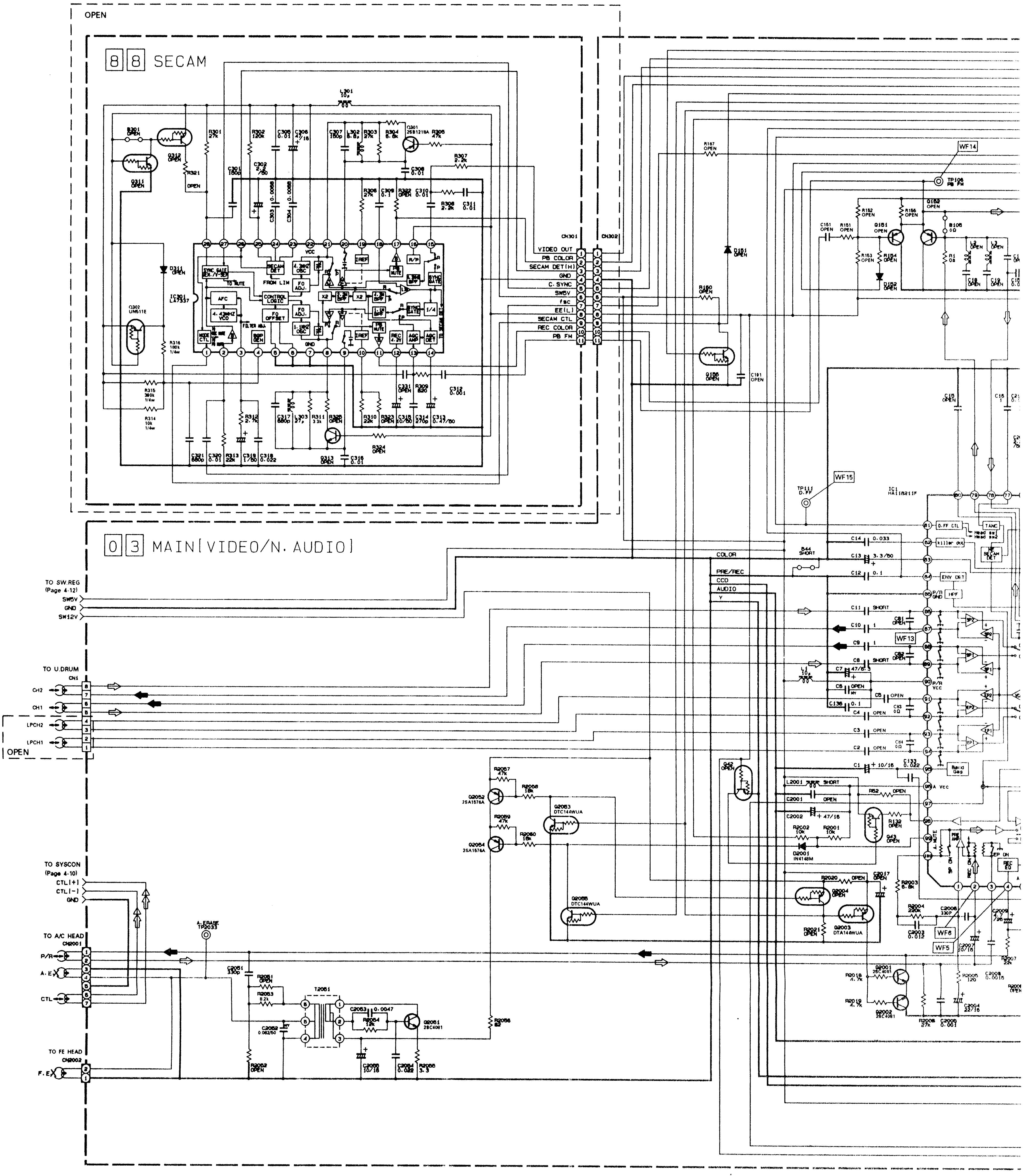
For general information in service manual, please refer to the Service Manual of GENERAL INFORMATION Edition 4 No. 82054D (January 1994).

4.1 BOARD INTERCONNECTIONS

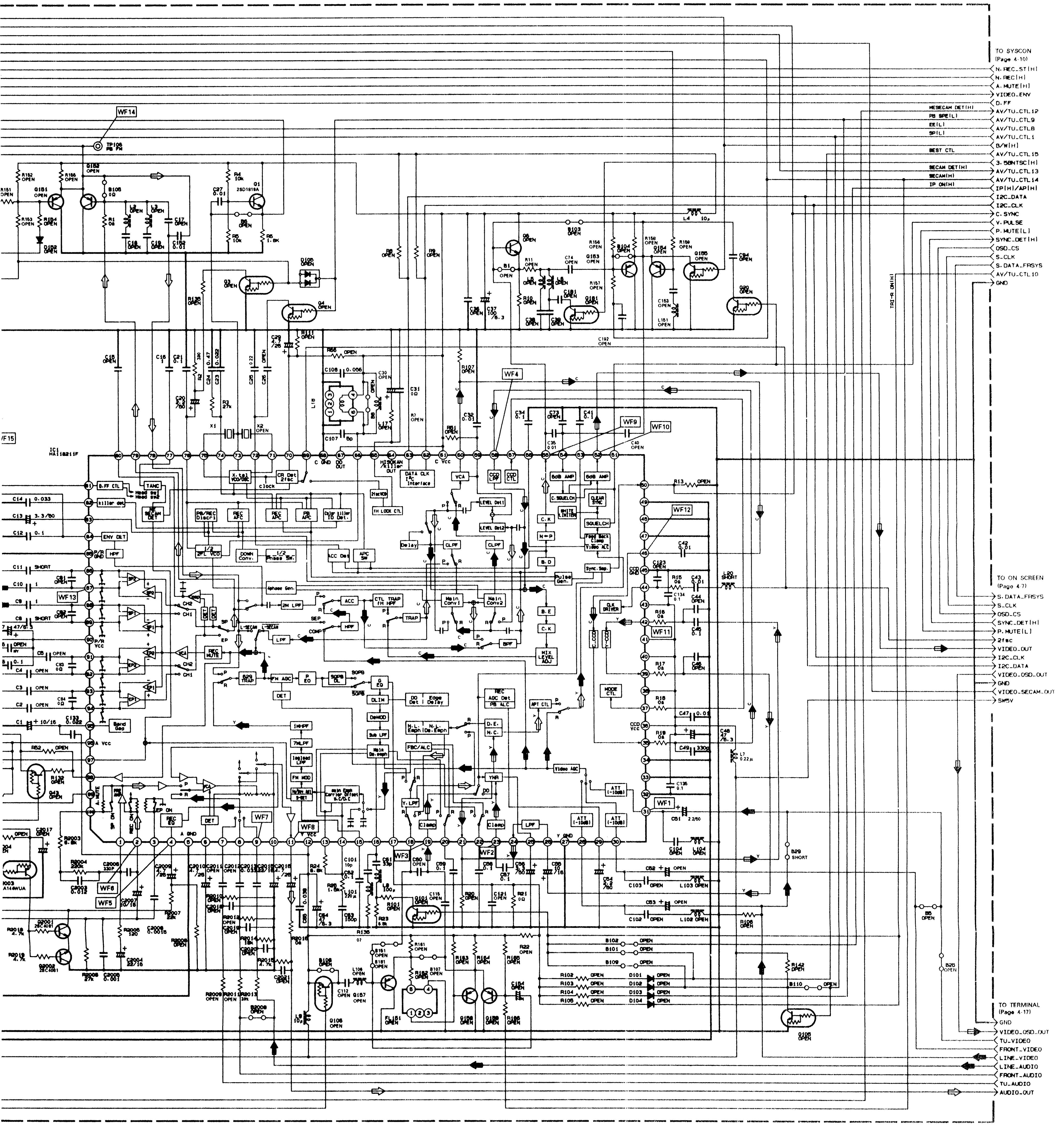

5
4
3
2
1
A
B
C
D
E
F
G
H
OPEN
9 1 R. PAUSE
FW7102
R. PAUSE
GND
FW7101
R. PAUSE
GND
9 4 LED
CN7006
LED
LED
OPEN
FW7001
LED
LED
CN7005
CN7002
LED
LED
NC
RF OUT
RF IN
TUNER
1 BB(AL5V)
2 AUDIO IN
3 SDA
4 MB(5V)
5 SCL
6 VIDEO IN
7 BT(30V)
8 PB(5V)
9 TU(30V)
10 PLL CLK
11 PLL DATA
12 TU CE
13 LOCK(L)
14 RF AGC
15 SW1
16 TP(IF)
17 9(9V)
18 AUDIO OUT
19 SIF OUT(NC)
20 AFT
21 SW2
22 VIDEO OUT
OPEN
8 8 SECAM
1 VIDEO OUT
2 PB COLOR
3 SECAM DET(H)
4 GND
5 C.SYNC
6 SW5V
7 fsc
8 EE(L)
9 SECAM CTL
10 REC COLOR
11 PB FM
REAR OUT
REAR IN
AUDIO
VIDEO
AUDIO
VIDEO
OPEN
J7152
J7151
AV1 IN/OUT
J7101
AV2 IN/DECODER
J7102
OPEN
9 3 LICHIUM BATTERY
FW7006
BACK UP
GND
FW7006
BACK UP
GND
AC INPUT AC220-240V 50/60HZ
CN5001
NEUTRAL
LIVE
0 3 MAIN
(VIDEO,N.AUDIO,SYSCON,SW.REG,TUNER,SW/DISPLAY,TERMINAL)
OPEN
8 5 SHUTTLE PLAY
CN7003
T1
T2
T3
T4
C1
T6
T1
T2
T3
T4
C1
T6
J7103
J7104
FRONT VIDEO IN
FRONT AUDIO IN
OPEN
CN2002
GND
FULL ERASE
FULL ERASE HEAD
F.E
CN3002
DRUM CTL V
D.PG
M12V
D.FG
GND(M)
CN1
DRUM MOTOR
M
OPEN
CN1
LP CH1
LP CH1
LP CH2
LP CH2
CH1
CH1
CH2
CH2
U. DRUM
LP CH1
LP CH2
CH1
CH2
OPEN
CN3001
GND(C)
CAP FG
CAP CTL V
SW5V
GND(M)
CAP REV(L)
NC
M12V
CAP MDA
M
CN3004
LSB
LSC
LSA
GND(C)
ROTARY ENCODER
CN2001
REC
PB
GND
AUDIO ERASE
GND
CTL(-)
CTL(+)
CN1
1 2 A/C HEAD
R/P
A.E
CTL
CN3003
LDM1
LDM2
5 5 LOADING MOTOR
M

9 4	LED
5 5	LOADING MOTOR
1 2	A/C HEAD
0 3	MAIN
NO	NAME

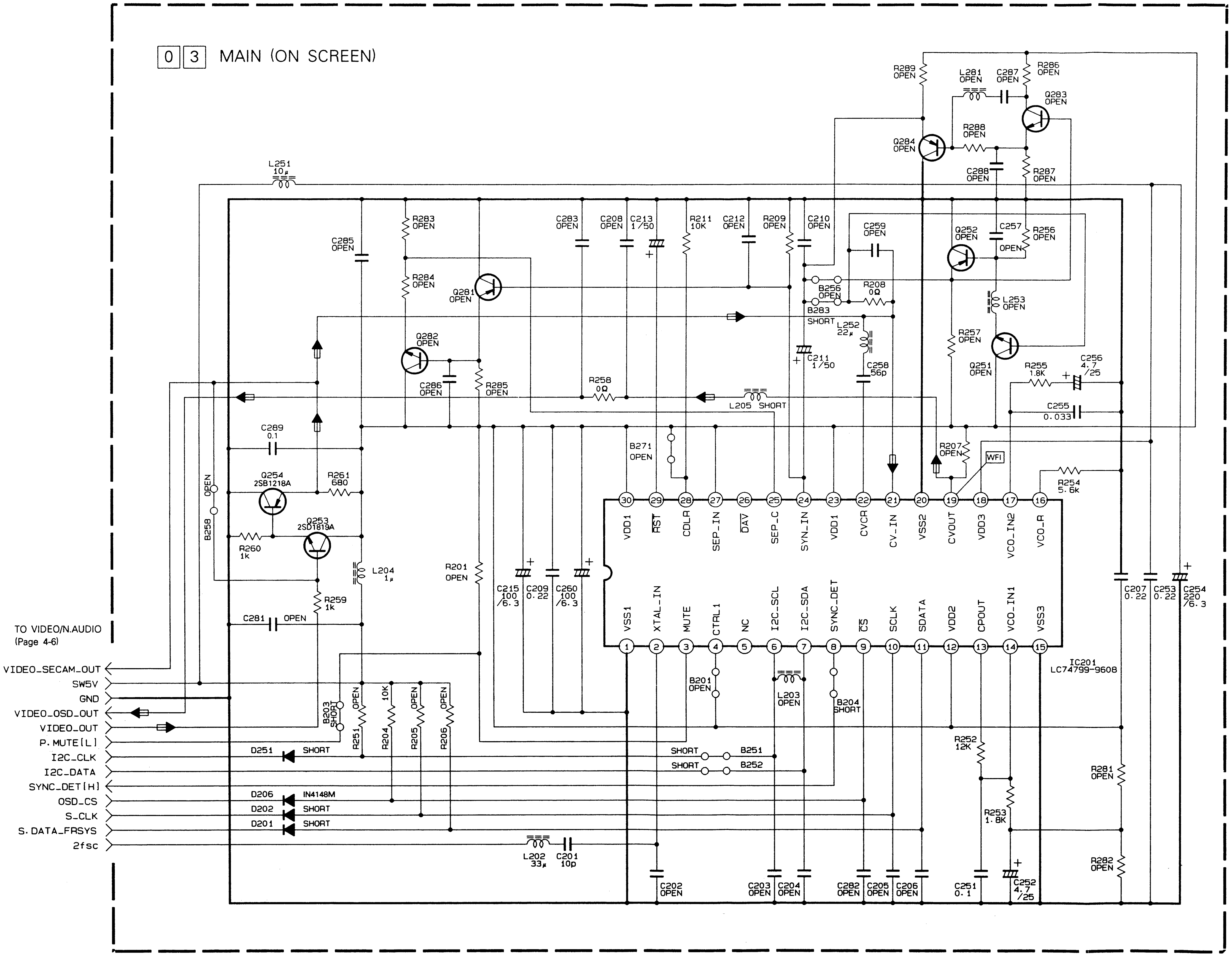
4.2 VIDEO/N.AUDIO SCHEMATIC DIAGRAM


OPEN
8 8 SECAM
IC301 LA7337
SYNC GATE
AFC
4.43MHz VCO
CONTROL LOGIC
FROM LIM
TO MUTE
SECAM DET
4.3MHz OSC
F0 ADJ.
F0 OFFSET
1.1MHz OSC
BGP GEN
MODE CTL
IREF
PB MUTE
REC 4.2V
AGC AMP
AGC DET
SYNC GATE
1/4
R/P
VIDEO OUT
PB COLOR
SECAM DET(H)
GND
C.SYNC
SW5V
fsc
EE(L)
SECAM CTL
REC COLOR
PB FM
CN301
CN302
Q301 2SB1218A
Q302 UN511E
Q311 OPEN
Q312 OPEN
Q313 OPEN
D311 OPEN
L301 10μ
0 3 MAIN(VIDEO/N.AUDIO)
TO SW.REG (Page 4-12)
SW5V
GND
SW12V
TO U.DRUM
CH1
CH2
CH1
LPCH2
LPCH1
OPEN
TO SYSCON (Page 4-10)
CTL(+)
CTL(-)
GND
TO A/C HEAD
CN2001
P/R
A.E
CTL
TO FE HEAD
CN2002
F.E
A.ERASE TP2033
T2051
Q2051 2SC4081
Q2052 2SA1576A
Q2053 DTC144WUA
Q2054 2SA1576A
Q2055 DTC144WUA
COLOR
PRE/REC
CCD
AUDIO
Y
TP111 D.FF
WF15
WF14
TP106 PB FM
WF13
WF6
WF5
IC1 HA118211F
D.FF CTL
killer det
ENV DET
HPF
Band Gap
A VCC
P/R GND
P/R VCC
Q151 OPEN
Q152 OPEN
Q155 OPEN
D151 OPEN
D152 OPEN
Q42 OPEN
Q43 OPEN
Q2001 2SC4081
Q2002 2SC4081
Q2003 DTA144WUA
Q2004 OPEN
D2001 1N4148M
L2001 SHORT
C2001 OPEN
C2002 47/16
5
4
3
2
1
A
B
C
D

NOTE : For VIDEO, PRE/REC and AUDIO waveforms, please refer to page 4-19.


TO SYSCON
(Page 4-10)
N.REC_ST[H]
N.REC[H]
A.MUTE[H]
VIDEO_ENV
D.FF
MESECAM DET[H]
AV/TU_CTL12
PB SPE[L]
AV/TU_CTL9
EE[L]
AV/TU_CTL8
SP[L]
AV/TU_CTL1
B/W[H]
BEST CTL
AV/TU_CTL15
3.58NTSC[H]
SECAM DET[H]
AV/TU_CTL13
SECAM[H]
AV/TU_CTL14
IP ON[H]
IP[H]/AP[H]
I2C_DATA
I2C_CLK
C.SYNC
V.PULSE
P.MUTE[L]
SYNC_DET[H]
OSD_CS
S.CLK
S.DATA_FRSYS
AV/TU_CTL10
GND
TRI-A ON[H]
TO ON SCREEN
(Page 4-7)
S.DATA_FRSYS
S.CLK
OSD_CS
SYNC_DET[H]
P.MUTE[L]
2fsc
VIDEO_OUT
I2C_CLK
I2C_DATA
VIDEO_OSD_OUT
GND
VIDEO_SECAM_OUT
SW5V
TO TERMINAL
(Page 4-17)
GND
VIDEO_OSD_OUT
TU_VIDEO
FRONT_VIDEO
LINE_VIDEO
LINE_AUDIO
FRONT_AUDIO
TU_AUDIO
AUDIO_OUT
IC1
WF1
WF2
WF3
WF4
WF5
WF6
WF7
WF8
WF9
WF10
WF11
WF12
WF13
WF14
TP106
PB FM
Q1
2SD1819A
X1
X2
DATA CLK
I2C
Interface
VCA
CCD LPF
CCD CTL
6dB AMP
C.SQUELCH
CLEAR SYNC
WHITE LIMITER
SQUELCH
Feed Back Clamp
Video ALC
Sync. Sep.
Pulse Gen.
CLK DRIVER
MODE CTL
X-tal VCO/OSC
CR Det 2fsc
clock
killer det
ENV DET
HPF
PB/REC Discri
REC AFC
REC APC
PB APC
Color killer ID Det.
2FL VCO
DOWN Conv.
1/2 Phase Sw.
ACC Det
APC SW
4phase Gen.
2M LPF
ACC
CTL TRAP FM HPF
TRAP
Main Conv1
Main Conv2
BPF
LEVEL Det1
LEVEL Det2
Delay
CLPF
C.K
N→P
B.D
B.E
MIX LEVEL ADJ
REC MUTE
LPF
FM AGC
P EQ
DET
DLIM
DeMOD
Sub LPF
Main De.emph
N.L. Emph
N.L. De.Emph
D.E.
N.C.
FBC/ALC
YNR
REC AGC Det PB ALC
APT CTL
Video AGC
ATT (-10dB)
Y.LPF
Clamp
REC EQ
Band Gap
A.MUTE
A GND
Y GND
A Vcc
CCD Vcc
CCD GND

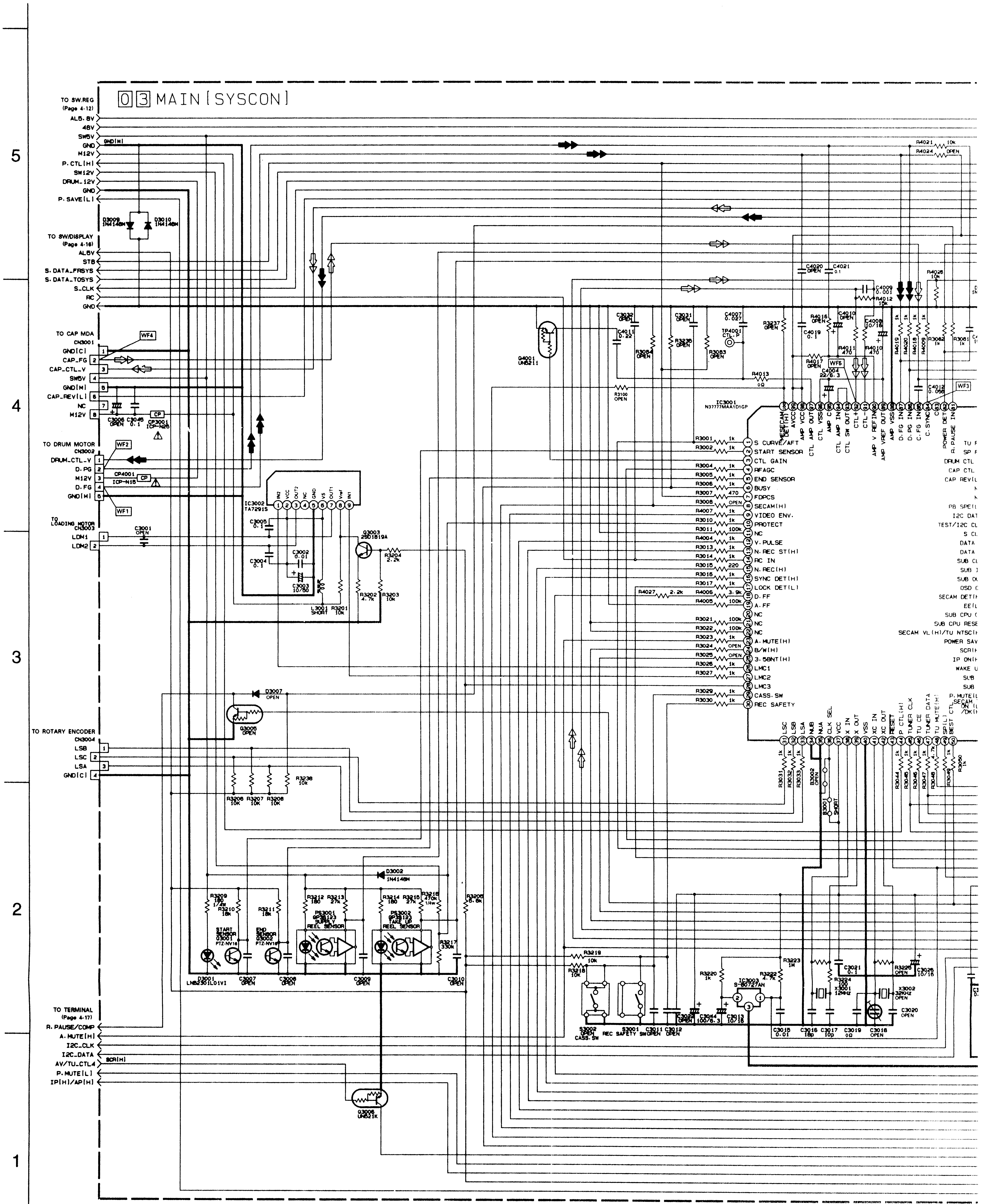
4.3 ON SCREEN SCHEMATIC DIAGRAM



03 MAIN (ON SCREEN)
TO VIDEO/N.AUDIO (Page 4-6)
VIDEO_SECAM_OUT
SW5V
GND
VIDEO_OSD_OUT
VIDEO_OUT
P. MUTE[L]
I2C_CLK
I2C_DATA
SYNC_DET[H]
OSD_CS
S_CLK
S. DATA_FRSYS
2fsc
IC201
LC74799-9608
VDD1
RST
CDLR
SEP_IN
DAV
SEP_C
SYN_IN
VDD1
CVCR
CV_IN
VSS2
CVOUT
VDD3
VCO_IN2
VCO_R
VSS1
XTAL_IN
MUTE
CTRL1
NC
I2C_SCL
I2C_SDA
SYNC_DET
CS
SCLK
SDATA
VDD2
CPOUT
VCO_IN1
VSS3
L251 10μ
R283 OPEN
R284 OPEN
C285 OPEN
Q281 OPEN
Q282 OPEN
C286 OPEN
R285 OPEN
C289 0.1
Q254 2SB1218A
R261 680
Q253 2SD1819A
R260 1k
B258 OPEN
L204 1μ
R259 1k
C281 OPEN
R201 OPEN
B203 SHORT
R251 OPEN
R204 10K
R205 OPEN
R206 OPEN
D251 SHORT
D206 IN4148M
D202 SHORT
D201 SHORT
L202 33μ
C201 10p
C202 OPEN
C283 OPEN
C208 OPEN
C213 1/50
R211 10K
C212 OPEN
R209 OPEN
C210 OPEN
C259 OPEN
B256 OPEN
R208 0Ω
B283 SHORT
L252 22μ
C211 1/50
C258 56p
R258 0Ω
L205 SHORT
B271 OPEN
C215 100 /6.3
C209 0.22
C260 100 /6.3
B201 OPEN
L203 OPEN
B204 SHORT
SHORT B251
SHORT B252
C203 OPEN
C204 OPEN
C282 OPEN
C205 OPEN
C206 OPEN
C251 0.1
C252 4.7 /25
R252 12K
R253 1.8K
R281 OPEN
R282 OPEN
C207 0.22
C253 0.22
C254 220 /6.3
R254 5.6k
WF1
R207 OPEN
R289 OPEN
L281 OPEN
C287 OPEN
R286 OPEN
Q283 OPEN
Q284 OPEN
R288 OPEN
C288 OPEN
R287 OPEN
Q252 OPEN
C257 OPEN
R256 OPEN
L253 OPEN
R257 OPEN
Q251 OPEN
R255 1.8K
C256 4.7 /25
C255 0.033
5
4
3
2
1
A
B
C
D
E
F
G
H

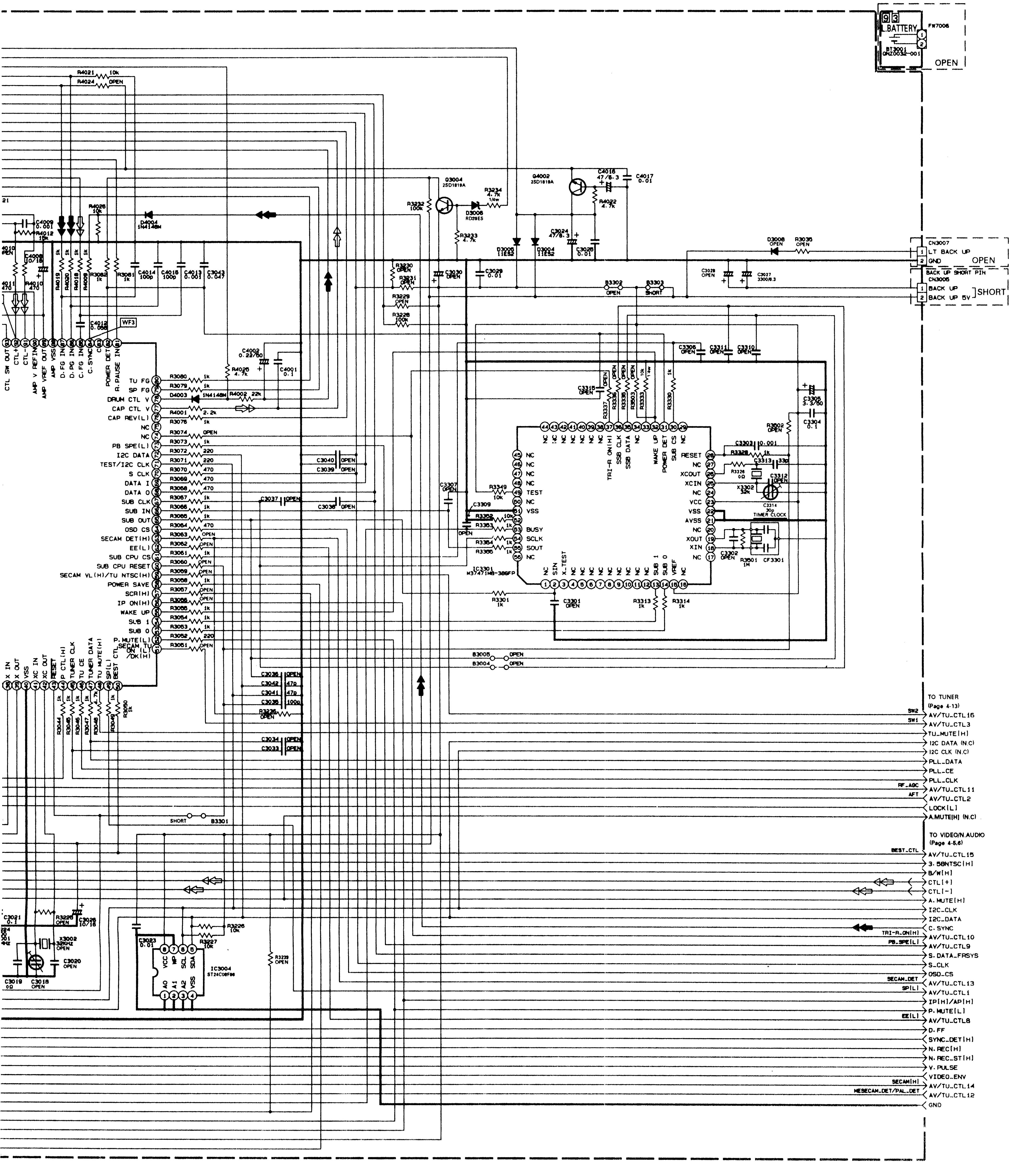
NOTE : For ON SCREEN waveform, please refer to page 4-19.

4.4 SYSCON SCHEMATIC DIAGRAM



03 MAIN [SYSCON]
TO SW.REG (Page 4-12)
AL8.8V
48V
SW5V
GND
M12V
P.CTL[H]
SW12V
DRUM_12V
GND
P.SAVE[L]
TO SW/DISPLAY (Page 4-16)
AL5V
STB
S.DATA_FRSYS
S.DATA_TOSYS
S_CLK
RC
GND
TO CAP MDA CN3001
GND[C]
CAP_FG
CAP_CTL_V
SW5V
GND[M]
CAP_REV[L]
NC
M12V
TO DRUM MOTOR CN3002
DRUM_CTL_V
D.PG
M12V
D.FG
GND[M]
TO LOADING MOTOR CN3003
LDM1
LDM2
TO ROTARY ENCODER CN3004
LSB
LSC
LSA
GND[C]
TO TERMINAL (Page 4-17)
R.PAUSE/COMP
A.MUTE[H]
I2C_CLK
I2C_DATA
AV/TU_CTL4
P.MUTE[L]
IP[H]/AP[H]
D3009 1N4148M
D3010 1N4148M
IC3002 TA7291S
Q3003 2SD1819A
Q4001 UN5211
Q3005 OPEN
Q3006 UN521K
D3007 OPEN
D3002 1N4148M
D3001 LNB2301L01VI
START SENSOR Q3001 PTZ-NV16
END SENSOR Q3002 PTZ-NV16
PS3001 GP3S123 SUPPLY REEL SENSOR
PS3002 GP3S123 TAKE UP REEL SENSOR
IC3001 N37777MAA1D1GP
IC3003 S-80727AN
X3001 12MHz
X3002 32kHz OPEN
S3002 OPEN CASS. SW
S3001 REC SAFETY SW OPEN
S CURVE/AFT
START SENSOR
CTL GAIN
RFAGC
END SENSOR
BUSY
FDPCS
SECAM[H]
VIDEO ENV.
PROTECT
NC
V.PULSE
N.REC ST[H]
RC IN
N.REC[H]
SYNC DET[H]
LOCK DET[L]
D.FF
A.FF
NC
NC
NC
A.MUTE[H]
B/W[H]
3.58NT[H]
LMC1
LMC2
LMC3
CASS.SW
REC SAFETY
LSC
LSB
LSA
NUB
NUA
CLK SEL
VCC
X IN
X OUT
VSS
XC IN
XC OUT
RESET
P CTL[H]
TUNER CLK
TU CE
TUNER DATA
TU MUTE[H]
SP[L]
BEST CTL
WF1
WF2
WF3
WF4
WF5
5
4
3
2
1

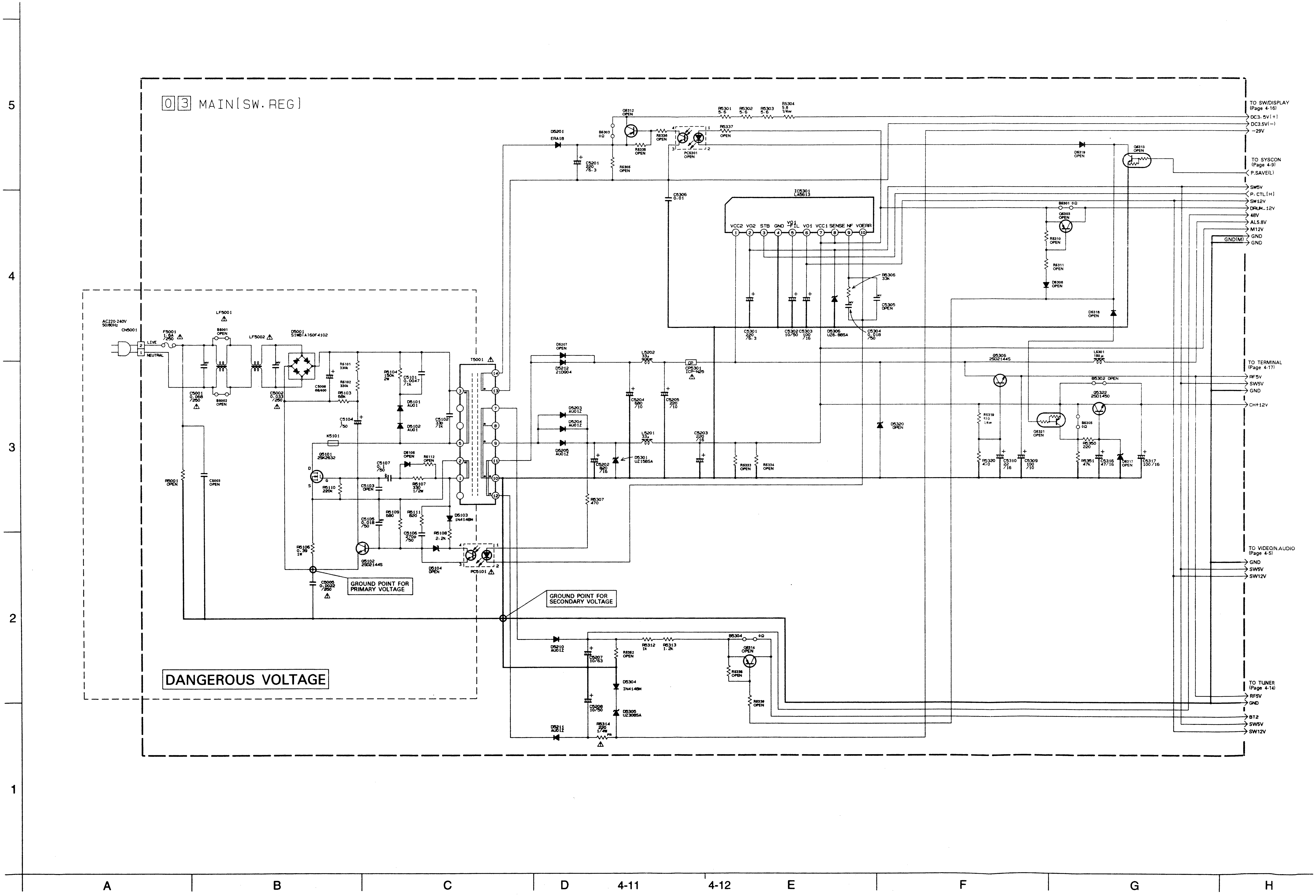
NOTES : 1. For SYSCON waveforms, please refer to page 4-19.
2. Be sure to remove R3238 when replacing the system controller IC3001 and the EEPROM IC3004.



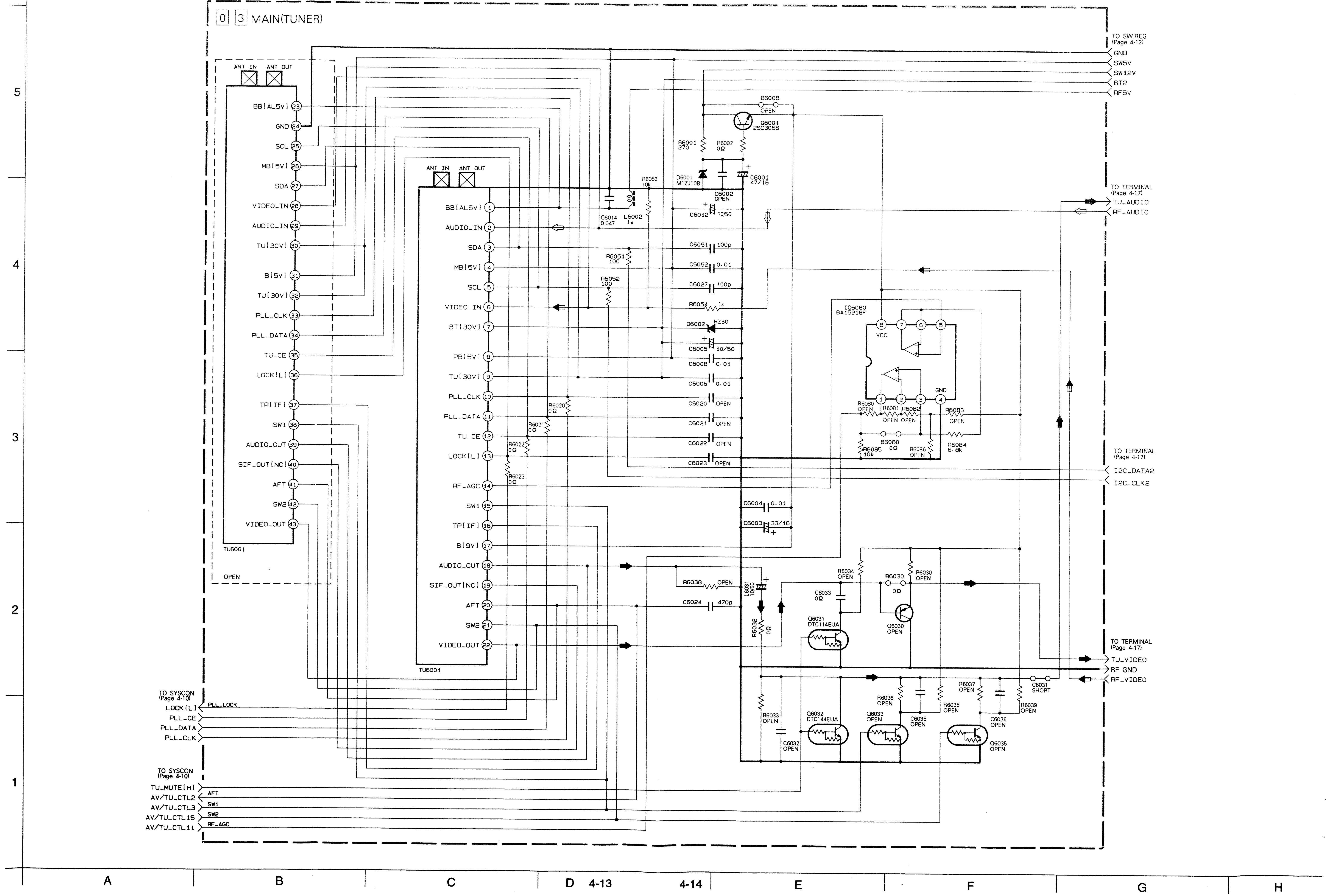
L.BATTERY
BT3001
GNZ0032-001
FW7006
OPEN
CN3007
LT BACK UP
GND
OPEN
BACK UP SHORT PIN
CN3005
BACK UP
BACK UP 5V
SHORT
Q3004
2SD1819A
Q4002
2SD1819A
D3006
D3005
D3004
D4004
1N4148M
IC3301
M37471M8-386FP
IC3004
ST24C08F86
X3002
32kHz
CF3301
TIMER CLOCK
TU FG
SP FG
DRUM CTL V
CAP CTL V
CAP REV(L)
PB SPE(L)
I2C DATA
TEST/I2C CLK
S CLK
DATA I
DATA O
SUB CLK
SUB IN
SUB OUT
OSD CS
SECAM DET(H)
EE(L)
SUB CPU CS
SUB CPU RESET
SECAM VL(H)/TU NTSC(H)
POWER SAVE
SCR(H)
IP ON(H)
WAKE UP
SUB 1
SUB 0
P.MUTE(L)
SECAM TU ON(L)/DK(H)
CTL SW OUT
CTL+
CTL-
AMP V REFIN
AMP VREF OUT
AMP VSS
D.FG IN
D.PG IN
C.FG IN
C.SYNC
POWER DET
R.PAUSE IN
X IN
X OUT
VSS
XC IN
XC OUT
RESET
P CTL(H)
TUNER CLK
TU CE
TUNER DATA
TU MUTE(H)
SP(L)
BEST CTL
WF3
RESET
XCOUT
XCIN
VCC
VSS
AVSS
XOUT
XIN
TEST
BUSY
SCLK
SOUT
TRI-R ON(H)
SSB CLK
SSB DATA
WAKE UP
POWER DET
SUB CS
SIN
X.TEST
SUB 1
SUB 0
VREF
VCC
WP
SCL
SDA
A0
A1
A2
VSS
SHORT
B3301
B3302
B3303
B3005
B3004
TO TUNER
(Page 4-13)
SW2
SW1
AV/TU_CTL16
AV/TU_CTL3
TU_MUTE(H)
I2C DATA (N.C)
I2C CLK (N.C)
PLL_DATA
PLL_CE
PLL_CLK
RF_AGC
AV/TU_CTL11
AFT
AV/TU_CTL2
LOCK(L)
A.MUTE(H) (N.C)
TO VIDEO/N.AUDIO
(Page 4-5,6)
BEST_CTL
AV/TU_CTL15
3.58NTSC(H)
B/W(H)
CTL(+)
CTL(-)
A.MUTE(H)
I2C_CLK
I2C_DATA
C.SYNC
TRI-R_ON(H)
AV/TU_CTL10
PB_SPE(L)
AV/TU_CTL9
S.DATA_FRSYS
S_CLK
OSD_CS
SECAM_DET
AV/TU_CTL13
SP(L)
AV/TU_CTL1
IP(H)/AP(H)
P.MUTE(L)
EE(L)
AV/TU_CTL8
D.FF
SYNC_DET(H)
N.REC(H)
N.REC_ST(H)
V.PULSE
VIDEO_ENV
SECAM(H)
AV/TU_CTL14
MESECAM_DET/PAL_DET
AV/TU_CTL12
GND

EPROM IC3004.

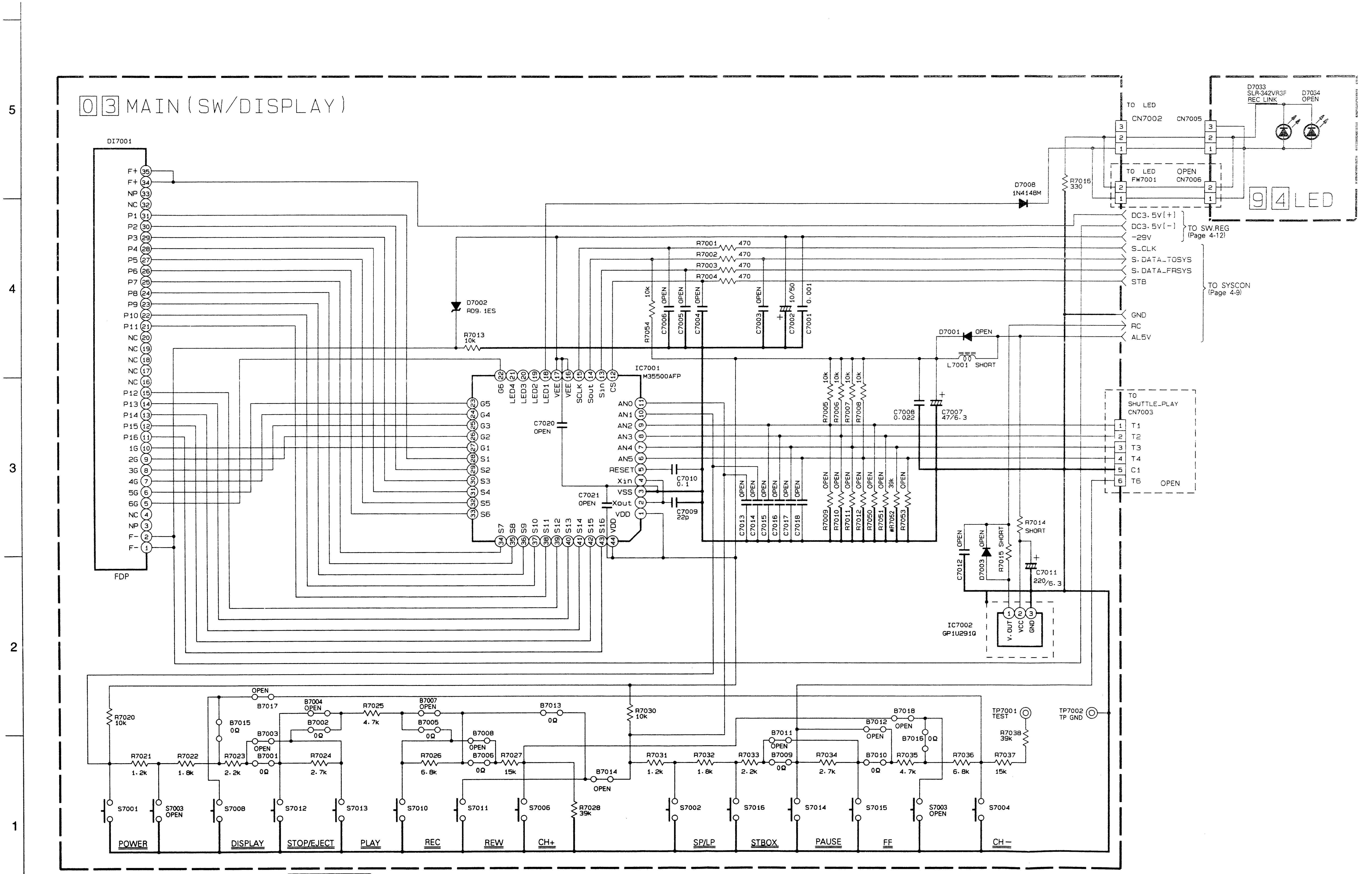
4.5 SWITCHING REGULATOR SCHEMATIC DIAGRAM


03 MAIN[SW. REG]
DANGEROUS VOLTAGE
AC220-240V 50/60Hz
CN5001
LIVE
NEUTRAL
F5001 1.6A /250
LF5001
B5001 OPEN
B5002 OPEN
LF5002
C5001 0.068 /250
C5002 0.033 /250
D5001 S1WB(A)60F4102
C5006 68/400
R5101 330k
R5102 330k
R5103 68k
R5104 150k 2W
C5101 0.0047 /1k
D5101 AU01
D5102 AU01
C5102 330 /1k
C5104 1 /50
K5101
Q5101 2SK2632
D
G
S
R5110 220k
C5107 0.1 /50
D5105 OPEN
R5112 OPEN
R5107 330 1/2W
C5103 OPEN
C5105 0.018 /50
R5109 680
R5111 820
C5106 270p /50
D5103 1N4148M
R5108 2.2k
D5104 OPEN
PC5101
Q5102 2SD2144S
R5106 0.39 1W
R5001 OPEN
C5003 OPEN
C5005 0.0022 /250
GROUND POINT FOR PRIMARY VOLTAGE
T5001
D5201 ERA18
C5201 220 /6.3
B5303 0Ω
Q5312 OPEN
R5335 OPEN
R5336 OPEN
R5305 OPEN
PC5301 OPEN
R5337 OPEN
R5301 5.6
R5302 5.6
R5303 5.6
R5304 5.6 1/4w
C5306 0.01
IC5301 LA5613
VCC2 VO2 STB GND VO1-FIL VO1 VCC1 SENSE NF VOERR
R5306 33k
C5305 OPEN
C5301 220 /6.3
C5302 10/50
C5303 100 /16
D5306 UZ6.8BSA
C5304 0.018 /50
D5207 OPEN
D5212 21DQ04
L5202 33μ
CP5301 ICP-N25
C5204 680 /10
C5205 220 /10
D5203 AU01Z
D5204 AU01Z
D5205 AU01Z
L5201 33μ
C5203 220 /16
C5202 820 /16
D5301 UZ15BSA
R5333 OPEN
R5334 OPEN
R5307 470
D5320 OPEN
GROUND POINT FOR SECONDARY VOLTAGE
D5210 AU01Z
C5207 10/63
R5352 OPEN
R5312 1k
R5313 1.2k
B5304 0Ω
Q5314 OPEN
R5338 OPEN
R5339 OPEN
D5304 1N4148M
D5305 UZ30BSA
C5208 10/50
D5211 AU01Z
R5314 220 1/4W FR
D5319 OPEN
Q5313 OPEN
B5301 0Ω
Q5303 OPEN
R5310 OPEN
R5311 OPEN
D5308 OPEN
D5318 OPEN
Q5306 2SD2144S
L5301 150μ
B5302 OPEN
Q5322 2SD1450
Q5321 OPEN
B5305 0Ω
R5319 510 1/4w
R5320 470
C5310 22 /16
C5309 100 /10
R5350 220
R5351 47k
C5316 47/16
D5317 OPEN
C5317 100 /16
TO SW/DISPLAY (Page 4-16)
DC3.5V(+)
DC3.5V(−)
−29V
TO SYSCON (Page 4-9)
P.SAVE(L)
SW5V
P.CTL(H)
SW12V
DRUM_12V
48V
AL5.8V
M12V
GND
GND(M)
GND
TO TERMINAL (Page 4-17)
RF5V
SW5V
GND
CH+12V
TO VIDEO/N.AUDIO (Page 4-5)
GND
SW5V
SW12V
TO TUNER (Page 4-14)
RF5V
GND
BT2
SW5V
SW12V
5
4
3
2
1
A
B
C
D
E
F
G
H

4.6 TUNER SCHEMATIC DIAGRAM


0 3 MAIN(TUNER)
ANT IN
ANT OUT
BB[AL5V] 23
GND 24
SCL 25
MB[5V] 26
SDA 27
VIDEO_IN 28
AUDIO_IN 29
TU[30V] 30
B[5V] 31
TU[30V] 32
PLL_CLK 33
PLL_DATA 34
TU_CE 35
LOCK[L] 36
TP[IF] 37
SW1 38
AUDIO_OUT 39
SIF_OUT[NC] 40
AFT 41
SW2 42
VIDEO_OUT 43
TU6001
OPEN
BB[AL5V] 1
AUDIO_IN 2
SDA 3
MB[5V] 4
SCL 5
VIDEO_IN 6
BT[30V] 7
PB[5V] 8
TU[30V] 9
PLL_CLK 10
PLL_DATA 11
TU_CE 12
LOCK[L] 13
RF_AGC 14
SW1 15
TP[IF] 16
B[9V] 17
AUDIO_OUT 18
SIF_OUT[NC] 19
AFT 20
SW2 21
VIDEO_OUT 22
TU6001
C6014 0.047
L6002 1μ
R6053 10k
R6051 100
R6052 100
R6020 0Ω
R6021 0Ω
R6022 0Ω
R6023 0Ω
B6008 OPEN
Q6001 2SC3066
R6001 270
R6002 0Ω
D6001 MTZJ10B
C6002 OPEN
C6001 47/16
C6012 10/50
C6051 100p
C6052 0.01
C6027 100p
R6054 1k
D6002 HZ30
C6005 10/50
C6008 0.01
C6006 0.01
C6020 OPEN
C6021 OPEN
C6022 OPEN
C6023 OPEN
C6004 0.01
C6003 33/16
IC6080 BA15218F
VCC
GND
R6080 OPEN
R6081 OPEN
R6082 OPEN
R6083 OPEN
B6080 0Ω
R6085 10k
R6086 OPEN
R6084 6.8k
R6038 OPEN
L6031 10μH
C6024 470p
R6032 0Ω
R6034 OPEN
C6033 0Ω
Q6031 DTC114EUA
B6030 0Ω
R6030 OPEN
Q6030 OPEN
R6033 OPEN
C6032 OPEN
Q6032 DTC144EUA
R6036 OPEN
Q6033 OPEN
C6035 OPEN
R6035 OPEN
R6037 OPEN
C6036 OPEN
Q6035 OPEN
C6031 SHORT
R6039 OPEN
TO SW.REG (Page 4-12)
GND
SW5V
SW12V
BT2
RF5V
TO TERMINAL (Page 4-17)
TU_AUDIO
RF_AUDIO
TO TERMINAL (Page 4-17)
I2C_DATA2
I2C_CLK2
TO TERMINAL (Page 4-17)
TU_VIDEO
RF GND
RF_VIDEO
TO SYSCON (Page 4-10)
LOCK[L]
PLL_LOCK
PLL_CE
PLL_DATA
PLL_CLK
TO SYSCON (Page 4-10)
TU_MUTE[H]
AV/TU_CTL2
AV/TU_CTL3
AV/TU_CTL16
AV/TU_CTL11
AFT
SW1
SW2
RF_AGC
5
4
3
2
1
A
B
C
D
E
F
G
H

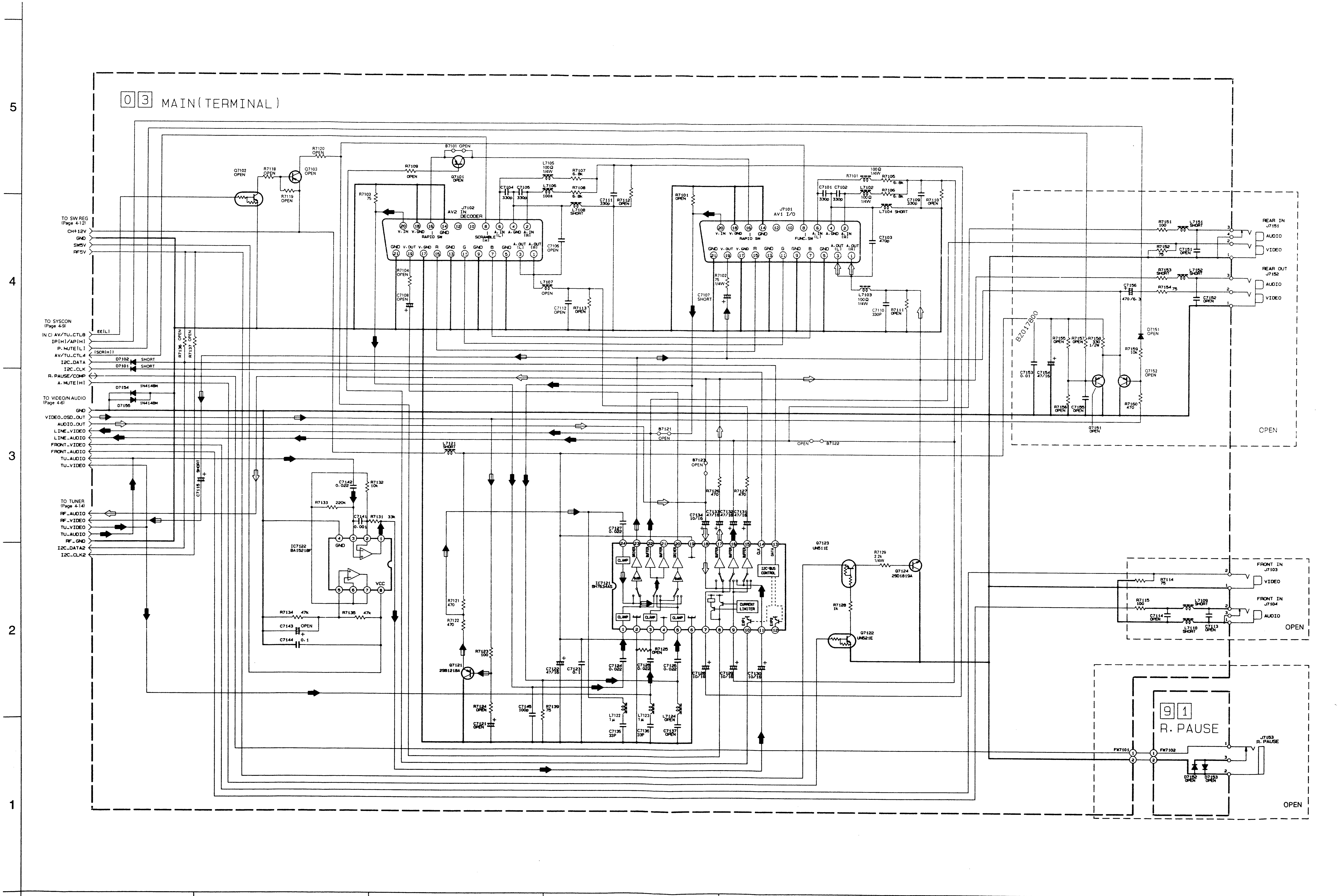
4.7 SW/DISPLAY SCHEMATIC DIAGRAM


5
4
3
2
1
03 MAIN (SW/DISPLAY)
94 LED
DI7001
FDP
F+ 35
F+ 34
NP 33
NC 32
P1 31
P2 30
P3 29
P4 28
P5 27
P6 26
P7 25
P8 24
P9 23
P10 22
P11 21
NC 20
NC 19
NC 18
NC 17
NC 16
P12 15
P13 14
P14 13
P15 12
P16 11
1G 10
2G 9
3G 8
4G 7
5G 6
6G 5
NC 4
NP 3
F- 2
F- 1
IC7001
M35500AFP
G6 LED4 LED3 LED2 LED1 VEE VEE SCLK Sout Sin CS
G5 G4 G3 G2 G1 S1 S2 S3 S4 S5 S6
S7 S8 S9 S10 S11 S12 S13 S14 S15 S16 VDD
AN0 AN1 AN2 AN3 AN4 AN5 RESET Xin VSS Xout VDD
C7020 OPEN
C7021 OPEN
C7010 0.1
C7009 22p
D7002 RD9.1ES
R7013 10k
R7001 470
R7002 470
R7003 470
R7004 470
R7054 10k
C7006 OPEN
C7005 OPEN
C7004 OPEN
C7003 OPEN
C7002 10/50
C7001 0.001
D7008 1N4148M
R7016 330
TO LED CN7002
CN7005
TO LED FW7001
OPEN CN7006
D7033 SLR-342VR3F REC LINK
D7034 OPEN
DC3.5V[+]
DC3.5V[-]
-29V
TO SW.REG (Page 4-12)
S_CLK
S.DATA_TOSYS
S.DATA_FRSYS
STB
TO SYSCON (Page 4-9)
GND
RC
AL5V
D7001 OPEN
L7001 SHORT
R7005 10k
R7006 10k
R7007 10k
R7008 10k
C7008 0.022
C7007 47/6.3
TO SHUTTLE_PLAY CN7003
T1 T2 T3 T4 C1 T6
OPEN
C7013 C7014 C7015 C7016 C7017 C7018 OPEN
R7009 R7010 R7011 R7012 R7050 OPEN
R7051 39k
#R7052
R7053 OPEN
R7014 SHORT
C7012 OPEN
D7003 OPEN
R7015 SHORT
C7011 220/6.3
IC7002 GP1U291Q
V.OUT VCC GND
R7020 10k
R7021 1.2k
R7022 1.8k
R7023 2.2k
R7024 2.7k
R7025 4.7k
R7026 6.8k
R7027 15k
R7028 39k
R7030 10k
R7031 1.2k
R7032 1.8k
R7033 2.2k
R7034 2.7k
R7035 4.7k
R7036 6.8k
R7037 15k
R7038 39k
B7001 0Ω
B7002 0Ω
B7003 OPEN
B7004 OPEN
B7005 0Ω
B7006 0Ω
B7007 OPEN
B7008 OPEN
B7009 0Ω
B7010 0Ω
B7011 OPEN
B7012 OPEN
B7013 0Ω
B7014 OPEN
B7015 0Ω
B7016 0Ω
B7017 OPEN
B7018 OPEN
TP7001 TEST
TP7002 TP GND
S7001 POWER
S7003 OPEN
S7008 DISPLAY
S7012 STOP/EJECT
S7013 PLAY
S7010 REC
S7011 REW
S7006 CH+
S7002 SP/LP
S7016 STBOX
S7014 PAUSE
S7015 FF
S7003 OPEN
S7004 CH−

NOTE : COMPARISON CHART OF MODELS & MARK (#).

REF.NO.		R7052
MODEL	HR-J255EK	OPEN
	HR-J255ES	USED

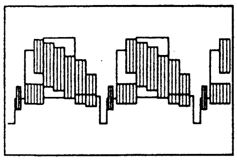
4.8 TERMINAL SCHEMATIC DIAGRAM


03 MAIN(TERMINAL)
TO SW REG (Page 4-12)
CH+12V
GND
SW5V
RF5V
TO SYSCON (Page 4-9)
EE(L)
(NC) AV/TU_CTL8
IP(H)/AP(H)
P.MUTE(L)
AV/TU_CTL4
I2C_DATA
I2C_CLK
R.PAUSE/COMP
A.MUTE(H)
TO VIDEO/N AUDIO (Page 4-6)
GND
VIDEO_OSD_OUT
AUDIO_OUT
LINE_VIDEO
LINE_AUDIO
FRONT_VIDEO
FRONT_AUDIO
TU_AUDIO
TU_VIDEO
TO TUNER (Page 4-14)
RF_AUDIO
RF_VIDEO
TU_VIDEO
TU_AUDIO
RF_GND
I2C_DATA2
I2C_CLK2
J7102 AV2 IN DECODER
J7101 AV1 I/O
IC7122 BA15218F
IC7121 BH7634AS
I2C-BUS CONTROL
CURRENT LIMITER
CLAMP
Q7121 2SB1218A
Q7122 UN521E
Q7123 UN511E
Q7124 2SD1819A
Q7151
Q7152 OPEN
BZ017800
REAR IN J7151
AUDIO
VIDEO
REAR OUT J7152
AUDIO
VIDEO
FRONT IN J7103
VIDEO
FRONT IN J7104
AUDIO
91 R. PAUSE
J7153 R. PAUSE
FW7101
FW7102
OPEN
A
B
C
D
E
F
G
H
1
2
3
4
5

WAVEFORMS

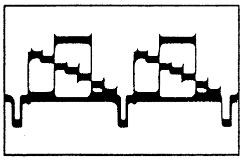
— VIDEO/N.AUDIO —

WF1 IC1-31



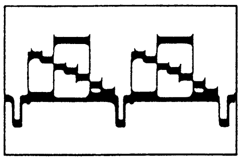
REC 0.98 Vp-p
20 mV/20 µsec/DIV

WF2 IC1-23



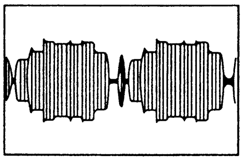
REC/PB 0.48 Vp-p
10 mV/20 µsec/DIV

WF3 IC1-19



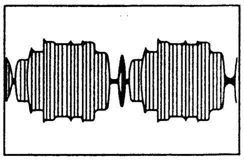
REC/PB 0.48 Vp-p
10 mV/20 µsec/DIV

WF4-1 IC1-58



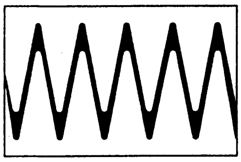
REC 0.68 Vp-p
20 mV/20 µsec/DIV

WF4-2 IC1-58



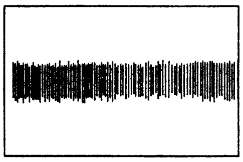
PB 0.64 Vp-p
20 mV/20 µsec/DIC

WF5 IC1-4



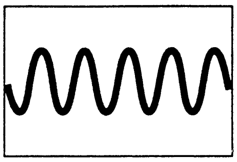
REC 0.82 Vp-p
20 mV/0.5 msec/DIV

WF6 IC1-2



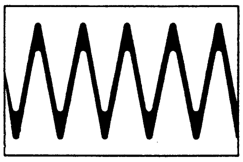
PB 10 mVp-p
5 mV/5 msec/DIV

WF7 IC1-9



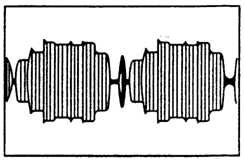
REC 0.11 Vp-p
5 mV/0.5 msec/DIV

WF8 IC1-11



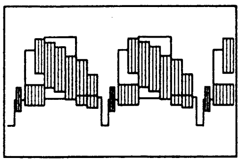
PB 0.64 Vp-p
20 mV/0.5 msec/DIV

WF9 IC1-55



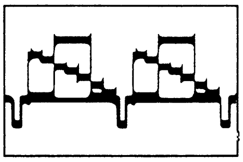
PB 0.57 Vp-p
20 mV/20 µsec/DIV

WF10 IC1-52



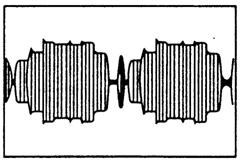
REC/PB 2.1 Vp-p
50 mV/20 µsec/DIV

WF11 IC1-42



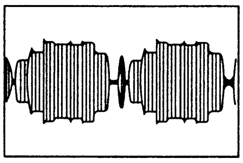
REC/PB 0.38 Vp-p
10 mV/20 µsec/DIV

WF12-1 IC1-46



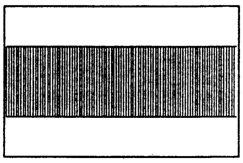
REC 0.42 Vp-p
10 mV/20 µsec/DIV

WF12-2 IC1-46



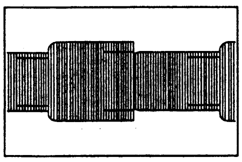
PB 0.4 Vp-p
10 mV/20 µsec/DIV

WF13 IC1-87



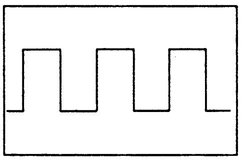
REC 1.7 Vp-p
50 mV/1 msec/DIV

WF14 TP106
PB FM



PB 0.4 Vp-p
10 mV/5 msec/DIV

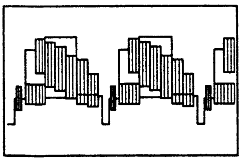
WF15 TP111
D.FF



REC/PB 5.2 Vp-p
0.2 V/10 msec/DIV

— ON SCREEN —

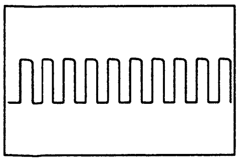
WF1 IC201-19
CVOUT



REC/PB 2.0 Vp-p
50 mV/20 µsec/DIV

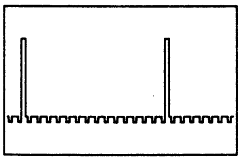
— SYSCON —

WF1 CN3002-4
D.FG



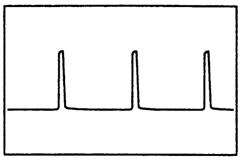
REC/PB 3.6 Vp-p
0.2 V/2 msec/DIV

WF2 CN3002-2
D.PG



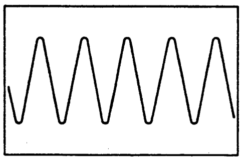
REC/PB 3.0 Vp-p
0.1 V/5 msec/DIV

WF3 IC3001-84
C.SYNC



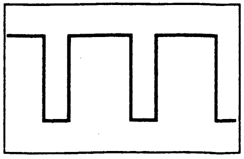
REC 3.8 Vp-p
0.2 V/20 µsec/DIV

WF4 CN3001-2
CAP FG



REC/PB 1.6 Vp-p
50 mV/1 msec/DIV

WF5 IC3001-92
CTL(+)



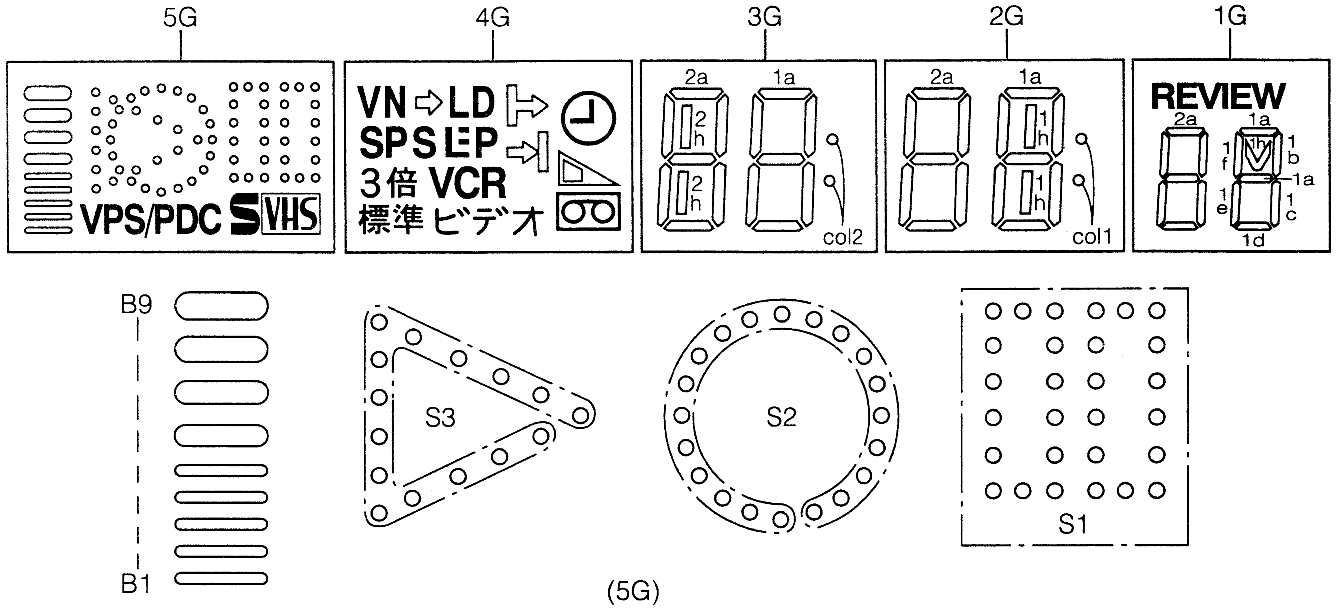
REC 3.8 Vp-p
0.1 V/10 msec/DIV

COMPONENT PARTS LOCATION GUIDE <MAIN>

REF.NO.	LOCATION		
CAPACITOR			
C1	A	D	14N
C2	B	C	15N
C3	B	C	15N
C4	B	C	15N
C5	B	C	16N
C6	A	D	15N
C7	A	D	16N
C8	B	C	15O
C9	B	C	15O
C10	B	C	16O
C11	B	C	16O
C12	B	C	16N
C13	A	D	17M
C14	B	C	16M
C15	B	C	16M
C16	B	C	17M
C17	B	C	17M
C18	B	C	17N
C19	B	C	17N
C20	A	D	17L
C21	B	C	16M
C23	B	C	17L
C24	B	C	16L
C25	B	C	17L
C26	A	D	17L
C27	B	C	16L
C29	A	D	16K
C30	A	D	15K
C31	B	C	16K
C32	B	C	15K
C34	B	C	14K
C35	B	C	14K
C36	B	C	15K
C37	A	D	15K
C38	B	C	14J
C39	B	C	13J
C40	B	C	14K
C41	B	C	14K
C42	A	D	12J
C43	B	C	13K
C44	B	C	13L
C45	B	C	13L
C46	B	C	12L
C47	B	C	13L
C48	A	D	13L
C49	B	C	13K
C51	A	D	13L
C52	A	D	13M
C53	A	D	12M
C54	A	D	12M
C55	A	D	12M
C56	A	D	12M
C57	B	C	12M
C58	B	C	12M
C59	B	C	11M
C60	B	C	11M
C61	B	C	12N
C62	B	C	12N
C63	B	C	13N
C64	A	D	12N
C65	B	C	12N
C73	B	C	14K
C74	B	C	14J
C81	B	C	16N
C82	B	C	15O
C83	B	C	16N
C84	B	C	15N
C94	B	C	14K
C101	B	C	12N
C102	A	D	12M
C103	B	C	13M
C104	B	C	12L
C107	B	C	15L
C108	B	C	15L
C121	B	C	11M
C122	B	C	10L
C123	B	C	14L
C133	A	D	14N
C134	B	C	14L
C135	B	C	13L
C136	B	C	15N
C151	A	D	18L
C152	B	C	17M
C153	B	C	13K
C154	A	D	11L
C155	B	C	11M
C181	B	C	13J
C182	B	C	10M
C183	B	C	11M
C184	B	C	11M
C185	B	C	13K
C191	B	C	21F
C192	B	C	14J
C201	B	C	17G
C202	B	C	18G
C203	B	C	18G
C204	B	C	19G
C205	B	C	18H
C206	B	C	18H
C207	B	C	19G
C208	B	C	19G
C209	B	C	18G
C210	B	C	19E
C211	A	D	19F
C212	B	C	19F
C213	A	D	19E
C215	A	D	17F
C251	B	C	19G
C252	A	D	19G
C253	B	C	19G
C254	A	D	20F
C255	B	C	19F
C256	A	D	20F
C257	B	C	20E
C258	B	C	19F
C259	B	C	19E
C260	A	D	17F
C281	B	C	19D
C282	B	C	18G
C283	B	C	19G
C285	B	C	20D
C286	B	C	19E
C287	B	C	20D
C288	B	C	20D
C289	B	C	20E
C2001	B	C	14N
C2002	A	D	14O
C2003	B	C	13O
C2004	A	D	13O
C2005	B	C	13O
C2006	B	C	13N
C2007	A	D	13N
C2008	B	C	13N
C2009	A	D	13N
C2010	A	D	12O
C2011	B	C	12N
C2012	B	C	12N
C2013	B	C	12N
C2015	A	D	12O
C2016	A	D	12N
C2017	A	D	11O
C2018	B	C	12O
C2019	B	C	12O
C2020	B	C	11O
C2021	A	D	11N
C2051	B	C	10O
C2052	A	D	9N
C2053	B	C	10N
C2054	B	C	9N
C2055	A	D	9O
C3001	B	C	7N
C3002	B	C	6M
C3003	A	D	6M
C3004	B	C	7N
C3005	B	C	6N
C3006	A	D	6L
C3007	B	C	4I
C3008	B	C	19I
C3009	B	C	16F
C3010	B	C	8G
C3011	B	C	18C
C3012	B	C	18C
C3013	A	D	14E
C3015	B	C	14E
C3016	B	C	13D
C3017	B	C	14D
C3018	A	D	14D
C3019	B	C	14D
C3020	B	C	14D
C3021	B	C	13D
C3022	B	C	14E
C3023	B	C	16G
C3024	A	D	4D
C3025	B	C	4D
C3026	A	D	7C
C3027	A	D	2D
C3028	A	D	2D
C3029	B	C	7D
C3030	A	D	8C
C3031	B	C	10E
C3032	B	C	9D
C3033	A	D	14F
C3034	A	D	14F
C3035	B	C	15F
C3036	B	C	10H
C3037	B	C	10G
C3038	B	C	9H
C3039	B	C	9H
C3040	B	C	9G
C3041	B	C	8H
C3042	B	C	8H
C3043	B	C	11F
C3044	A	D	14E
C3045	B	C	6L
C3301	B	C	15D
C3302	B	C	16C
C3303	B	C	17D
C3304	B	C	16C
C3305	A	D	17C
C3306	B	C	17E
C3307	B	C	15D
C3309	B	C	15E
C3310	A	D	17E
C3311	A	D	16E
C3312	B	C	17C
C3313	B	C	17C
C3314	A	D	17C
C3315	B	C	16E
C4001	B	C	8H
C4002	A	D	8H
C4004	A	D	10F
C4007	B	C	9F
C4008	A	D	8F
C4009	B	C	9F
C4010	A	D	10F
C4011	B	C	9E
C4012	B	C	9F
C4013	B	C	9G
C4014	B	C	11F
C4015	B	C	10F
C4016	A	D	4D
C4017	B	C	4D
C4019	B	C	10E
C4020	B	C	10F
C4021	B	C	9G
C5001	A	D	3P
C5002	A	D	1N
C5003	A	D	4P
C5005	A	D	1L
C5006	A	D	2M
C5101	A	D	3K
C5102	A	D	3K
C5103	B	C	2L
C5104	A	D	3L
C5105	A	D	2K
C5106	A	D	3M
C5107	A	D	2K
C5201	A	D	1I
C5202	A	D	3H
C5203	A	D	3G
C5204	A	D	2G
C5205	A	D	1F
C5207	A	D	3H
C5208	A	D	1H
C5301	A	D	2E
C5302	A	D	2E
C5303	A	D	3E
C5304	A	D	3D
C5305	A	D	3E
C5306	B	C	1C
C5309	A	D	4D
C5310	A	D	3D
C5316	A	D	3G
C5317	A	D	3G
C6001	A	D	21H
C6002	B	C	21H
C6003	A	D	21H
C6004	B	C	20H
C6005	A	D	21K
C6006	B	C	22L
C6008	B	C	21L
C6012	A	D	21L
C6014	B	C	21P
C6020	B	C	22K
C6021	B	C	22K
C6022	B	C	22K
C6023	B	C	22K
C6024	B	C	22J
C6027	B	C	22O
C6031	A	D	20I
C6032	B	C	20I
C6033	B	C	21J
C6035	B	C	21J
C6036	B	C	21I
C6051	B	C	22O
C6052	B	C	22O
C7001	B	C	9B
C7002	A	D	9A
C7003	A	D	10B
C7004	A	D	10B
C7005	A	D	10B
C7006	A	D	10B
C7007	A	D	9B
C7008	B	C	10B
C7009	B	C	13B
C7010	B	C	13B
C7011	A	D	8B
C7012	B	C	9B
C7013	B	C	15A
C7014	B	C	18A
C7015	A	D	15B
C7016	B	C	15B
C7017	B	C	13B
C7018	B	C	16B
C7020	A	D	11B
C7021	A	D	13B
C7101	B	C	17P
C7102	B	C	17P
C7103	B	C	18P
C7104	B	C	13P
C7105	B	C	13P
C7106	B	C	14P
C7107	A	D	19O
C7108	A	D	10P
C7109	B	C	19P
C7110	B	C	18P
C7111	B	C	15P
C7112	B	C	14P
C7113	B	C	19A
C7114	B	C	20A
C7115	A	D	20O
C7121	A	D	18N
C7122	A	D	20M
C7123	B	C	20M
C7124	B	C	20N
C7125	A	D	20N
C7126	A	D	20N
C7127	B	C	19M
C7128	A	D	21N
C7129	A	D	21N
C7130	A	D	21N
C7131	A	D	21M
C7132	A	D	21M
C7133	A	D	21L
C7134	A	D	20M
C7135	B	C	20M
C7136	B	C	19N
C7137	B	C	20N
C7141	B	C	20L
C7142	A	D	20K
C7143	A	D	20K
C7144	B	C	20K
C7145	B	C	20N
C7151	B	C	20P
C7152	B	C	21P
C7153	B	C	18M
C7154	A	D	18L
C7155	B	C	18M
C7156	A	D	20O
CONNECTOR			
CN1	A	D	14O
CN302	A	D	22E
CN2001	A	D	9O
CN2002	A	D	19L
CN3001	A	D	7L
CN3002	A	D	9P
CN3003	A	D	7N
CN3004	A	D	9F
CN3005	A	D	3D
CN3007	A	D	10P
CN5001	A	D	1P
CN7002	A	D	16A
CN7003	A	D	2C
CN7005	A	D	20C
CN7006	A	D	20C
CIRCUIT PROTECTOR			
CP3001	A	D	5L
CP4001	A	D	7O
CP5301	A	D	1E
DIODE			
D101	A	D	11L
D102	A	D	12L
D103	A	D	12L
D104	A	D	11L
D105	B	C	17L
D151	A	D	21E
D152	A	D	17K
D201	A	D	17G
D202	A	D	17G
D206	A	D	17G
D251	A	D	16G
D2001	A	D	13O
D3001	A	D	12H
D3002	A	D	6E
D3004	A	D	5C
D3005	A	D	7C
D3006	A	D	6C
D3007	A	D	8G
D3008	A	D	6C
D3009	A	D	6O
D3010	A	D	6O
D4003	A	D	8H
D4004	A	D	7H
D5001	B	C	2N
D5101	A	D	3K
D5102	A	D	3K
D5103	A	D	3L
D5104	A	D	3M
D5105	A	D	2K
D5201	A	D	1I
D5203	A	D	3I
D5204	A	D	3I
D5205	A	D	3I
D5207	A	D	2I
D5210	A	D	3I
D5211	A	D	2H
D5212	A	D	2I
D5301	A	D	2I
D5304	A	D	1E
D5305	A	D	1E
D5306	A	D	2E
D5308	A	D	3F
D5317	A	D	4H
D5318	A	D	3H
D5319	A	D	4E
D5320	A	D	1E
D6001	A	D	21H
D6002	A	D	21K
D7001	A	D	9B
D7002	A	D	14A
D7003	A	D	8A
D7008	A	D	15B
D7033	A	D	20C
D7034	A	D	20C
D7101	A	D	19L
D7102	A	D	20L
D7151	A	D	18M
D7152	A	D	18O
D7153	A	D	18O
D7154	A	D	17O
D7155	A	D	17O
DI7001	A	D	12A
IC			
IC1	B	C	14M
IC201	A	D	18G
IC3001	B	C	12E
IC3002	A	D	7M
IC3003	A	D	14E
IC3004	A	D	16G
IC3301	B	C	16D
IC5301	A	D	2E
IC6080	B	C	22M
IC7001	B	C	12B
IC7002	A	D	8A
IC7121	A	D	20M
IC7122	B	C	20K
COIL			
L1	A	D	16N
L2	A	D	17N
L3	A	D	17M
L4	A	D	16K
L5	A	D	14J
L6	A	D	13J
L7	A	D	12K
L8	A	D	11N
L9	A	D	10L
L17	A	D	15L
L18	A	D	16L
L20	A	D	16K
L101	A	D	11M
L102	A	D	12M
L103	A	D	13M
L104	A	D	12L
L106	A	D	11M
L151	A	D	13K
L181	A	D	11M
L182	A	D	13K
L202	A	D	18G
L203	A	D	18G
L204	A	D	19D
L205	A	D	20G
L251	A	D	20E
L252	A	D	19F
L253	A	D	20E
L281	A	D	19E
L2001	A	D	14O
L3001	A	D	6M
L5201	A	D	3G
L5202	A	D	2G
L5301	A	D	4D
L6002	A	D	21O
L6031	A	D	21J
L7001	A	D	9B
L7101	A	D	17Q
L7102	A	D	18P
L7103	A	D	18P
L7104	A	D	17Q
L7105	A	D	13Q
L7106	B	C	14P
L7107	B	C	14P
L7108	A	D	13Q
L7109	A	D	20A
L7110	A	D	20A
L7121	A	D	18L
L7122	A	D	19N
L7123	A	D	20N
L7124	A	D	20N
L7151	B	C	19P
L7152	A	D	21O
TRANSISTOR			
Q1	B	C	16L
Q3	B	C	17L
Q4	B	C	17L
Q6	B	C	15J
Q20	B	C	13K
Q42	B	C	17O
Q43	B	C	16O
Q101	B	C	10M
Q105	B	C	11L
Q106	B	C	10L
Q151	B	C	17M
Q152	B	C	17M
Q153	B	C	14K
Q154	B	C	14K
Q155	B	C	15J
Q156	B	C	21F
Q157	B	C	10M
Q158	B	C	10L
Q159	B	C	10L
Q181	B	C	13J
Q183	B	C	6H
Q184	B	C	11M
Q251	B	C	20E
Q252	B	C	20E
Q253	B	C	20F
Q254	B	C	20F
Q281	B	C	19F
Q282	B	C	19F
Q283	B	C	20D
Q284	B	C	19E
Q2001	B	C	12O
Q2002	B	C	12O
Q2003	B	C	11O
Q2004	B	C	11O
Q2051	B	C	10N
Q2052	B	C	10O
Q2053	B	C	11O
Q2054	B	C	10N
Q2055	B	C	11N
Q3001	A	D	4I
Q3002	A	D	19I
Q3003	B	C	6M
Q3004	B	C	5C
Q3005	B	C	10J
Q3006	B	C	10P
Q4001	B	C	9E
Q4002	B	C	5D
Q5101	A	D	2L
Q5102	A	D	2L
Q5303	A	D	3F
Q5306	A	D	3D
Q5312	B	C	1D
Q5313	B	C	4H
Q5314	B	C	3F
Q5321	B	C	3G
Q5322	A	D	3G
Q6001	A	D	20H
Q6030	B	C	21I
Q6031	B	C	21J
Q6032	B	C	21I
Q6033	B	C	21J
Q6035	B	C	21I
Q7101	B	C	11P
Q7102	B	C	18K
Q7103	B	C	18L
Q7121	B	C	18M
Q7122	B	C	20K
Q7123	B	C	20L
Q7124	B	C	20L
Q7151	B	C	18M
Q7152	B	C	18M
RESISTOR			
R1	B	C	17M
R2	B	C	16L
R3	B	C	16L
R4	B	C	17K
R5	B	C	16L
R6	B	C	16L
R7	B	C	15K
R8	B	C	16J
R9	B	C	16J
R10	B	C	15J
R11	B	C	14J
R13	B	C	11K
R15	B	C	13L
R16	A	D	12K
R17	A	D	13L
R18	A	D	13J
R19	B	C	13K
R20	B	C	11M
R21	B	C	11M
R22	B	C	11L
R23	B	C	11N
R24	B	C	13N
R25	B	C	13N
R51	B	C	15K
R52	B	C	16N
R66	B	C	16K
R101	B	C	10N
R102	B	C	11L
R103	B	C	11L
R104	B	C	12L
R105	B	C	11L
R106	B	C	12L
R107	B	C	15J
R111	B	C	16L
R132	B	C	16O
R135	B	C	16L
R136	B	C	11N
R142	B	C	11L
R151	B	C	17L
R152	B	C	17L
R153	A	D	18L
R154	B	C	17L
R155	B	C	17M
R156	B	C	14J
R157	B	C	14J
R158	B	C	15J
R159	B	C	14J
R160	B	C	22F
R161	B	C	10M
R162	B	C	10M
R163	B	C	10L
R164	B	C	11L
R165	B	C	10L
R166	B	C	11L
R167	A	D	21E
R181	B	C	10M
R182	B	C	10M
R183	B	C	11M
R201	B	C	18G
R204	B	C	17G
R205	B	C	17G
R206	B	C	17G
R207	B	C	19G
R208	B	C	20E
R209	B	C	19E
R211	B	C	18F
R251	B	C	17F
R252	B	C	19G
R253	B	C	19G
R254	B	C	19F
R255	B	C	19F
R256	B	C	20E
R257	B	C	20E
R258	B	C	20G
R259	B	C	20F
R260	B	C	20F
R261	B	C	20F
R281	B	C	19G
R282	B	C	19G
R283	B	C	19E
R284	B	C	18F
R285	B	C	19E
R286	A	D	19D
R287	B	C	20D
R288	B	C	19E
R289	A	D	19E
R2001	B	C	15N
R2002	B	C	13O
R2003	B	C	13O
R2004	B	C	13O
R2005	B	C	13O
R2006	B	C	13O
R2007	A	D	12O
R2008	B	C	13O
R2009	B	C	12N
R2010	B	C	12O
R2011	B	C	12N
R2012	B	C	11O
R2013	B	C	12N
R2014	B	C	11N
R2015	A	D	11N
R2016	B	C	11N
R2018	B	C	12O
R2019	B	C	12O
R2020	B	C	11O
R2021	B	C	11O
R2051	B	C	10O
R2052	B	C	10O
R2053	B	C	10O
R2054	B	C	9N
R2055	B	C	9N
R2056	A	D	10N
R2057	B	C	10O
R2058	B	C	10O
R2059	B	C	10O
R2060	B	C	10N
R3001	B	C	10E
R3002	B	C	9E
R3004	A	D	7K
R3005	B	C	9E
R3006	B	C	10E
R3007	B	C	9E
R3008	B	C	8D
R3010	B	C	9D
R3011	B	C	8E
R3013	B	C	9D
R3014	B	C	9D
R3015	B	C	10D
R3016	B	C	9D
R3017	B	C	9D
R3021	B	C	10D
R3022	B	C	10D
R3023	B	C	10D
R3024	B	C	11D
R3025	B	C	11D
R3026	B	C	9D
R3027	B	C	9D
R3029	B	C	11D
R3030	B	C	11D
R3031	B	C	11D
R3032	B	C	11D
R3033	B	C	12D
R3035	A	D	6C
R3044	B	C	13E
R3045	B	C	13D
R3046	B	C	14E
R3047	B	C	14E
R3048	B	C	14C
R3049	B	C	14E
R3050	B	C	14E
R3051	B	C	14F
R3052	B	C	14F
R3053	A	D	15F
R3054	B	C	14F
R3055	A	D	14F
R3056	B	C	13F
R3057	B	C	13F
R3058	B	C	13F
R3059	B	C	13G
R3060	B	C	13G
R3061	A	D	13F
R3062	B	C	13G
R3063	B	C	11G
R3064	B	C	11G
R3065	B	C	11G
R3066	A	D	10G
R3067	B	C	11G
R3068	B	C	10G
R3069	B	C	13F
R3070	B	C	10G
R3071	B	C	10G
R3072	B	C	10G
R3073	B	C	10G
R3074	A	D	8I
R3076	B	C	8H
R3079	A	D	9G
R3080	B	C	9G
R3081	B	C	9G
R3082	B	C	6G
R3083	B	C	9E
R3084	B	C	8D
R3100	B	C	9E
R3201	B	C	6M
R3202	B	C	6M
R3203	B	C	6M
R3204	B	C	5M
R3205	A	D	8C
R3206	B	C	9C
R3207	B	C	8C
R3208	B	C	7C
R3209	A	D	5I
R3210	B	C	7F
R3211	B	C	7E
R3212	B	C	16F
R3213	B	C	15F
R3214	B	C	8G
R3215	B	C	8G
R3216	A	D	5F
R3217	B	C	8E
R3218	B	C	12D
R3219	B	C	12D
R3220	B	C	14E
R3222	B	C	14E
R3223	B	C	13D
R3224	B	C	13D
R3225	B	C	13D
R3226	B	C	15G
R3227	B	C	16G
R3228	B	C	7C
R3229	B	C	9C
R3230	B	C	9G
R3231	B	C	16G
R3232	B	C	5C
R3233	B	C	5C
R3234	A	D	5C
R3235	B	C	9E
R3236	B	C	10H
R3237	B	C	9E
R3238	B	C	8G
R3239	A	D	8H
R3301	B	C	15D
R3313	B	C	15D
R3314	B	C	15D
R3326	B	C	17C
R3328	B	C	17D
R3330	B	C	17D
R3333	A	D	17E
R3335	B	C	17E
R3336	B	C	16E
R3337	B	C	16E
R3349	B	C	15E
R3352	B	C	15E
R3353	B	C	15E
R3354	B	C	15E
R3355	B	C	15E
R3501	B	C	16C
R3502	B	C	17C
R3503	B	C	17E
R4001	B	C	8H
R4002	B	C	8G
R4004	B	C	9D
R4005	B	C	9D
R4006	B	C	11D
R4007	B	C	8D
R4009	B	C	9F
R4010	B	C	10F
R4011	B	C	10F
R4012	B	C	9F
R4013	B	C	10E
R4016	B	C	10F
R4017	A	D	10F
R4018	B	C	7H
R4019	B	C	10F
R4020	B	C	9F
R4021	B	C	9G
R4022	B	C	5D
R4024	B	C	7H
R4025	B	C	8G
R4026	B	C	9G
R4027	B	C	21C
R5001	A	D	4P
R5101	A	D	3M
R5102	A	D	3M
R5103	A	D	3M
R5104	A	D	4M
R5106	A	D	2L
R5107	A	D	1K
R5108	B	C	3L
R5109	B	C	2K
R5110	B	C	2L
R5111	B	C	3L
R5112	B	C	1K
R5301	B	C	1D
R5302	B	C	1D
R5303	B	C	1C
R5304	A	D	1C
R5305	A	D	1H
R5306	B	C	3E
R5307	B	C	4H
R5310	B	C	2F
R5311	B	C	2F
R5312	B	C	4F
R5313	B	C	3F
R5314	A	D	1G
R5319	A	D	3E
R5320	B	C	3D
R5333	A	D	2F
R5334	A	D	2F
R5335	B	C	1D
R5336	B	C	2D
R5337	A	D	3D
R5338	B	C	3F
R5339	B	C	3F
R5350	B	C	3G
R5351	B	C	4H
R5352	B	C	3H
R6001	B	C	21H
R6002	B	C	20H
R6020	B	C	21K
R6021	B	C	21K
R6022	B	C	21K
R6023	B	C	21K
R6030	B	C	21I
R6032	B	C	20J
R6033	B	C	20I
R6034	B	C	21J
R6035	B	C	21J
R6036	B	C	21J
R6037	B	C	20I
R6038	B	C	22J
R6039	B	C	21I
R6051	B	C	22O
R6052	B	C	22N
R6053	B	C	22O
R6054	B	C	21O
R6080	B	C	22N
R6081	B	C	22N
R6082	B	C	22N
R6083	B	C	22N
R6084	B	C	22L
R6085	B	C	22N
R6086	B	C	22N
R7001	B	C	10B
R7002	B	C	10B
R7003	B	C	10B
R7004	B	C	10B
R7005	A	D	14B
R7006	A	D	14B
R7007	B	C	15B
R7008	A	D	15B
R7009	A	D	14A
R7010	A	D	14A
R7011	B	C	13B
R7012	B	C	14B
R7013	B	C	15A
R7014	B	C	8B
R7015	B	C	8B
R7016	B	C	16A
R7020	B	C	14B
R7021	B	C	16A
R7022	B	C	16B
R7023	B	C	6B
R7024	B	C	3B
R7025	B	C	5B
R7026	B	C	4B
R7027	B	C	6B
R7028	B	C	6B
R7030	B	C	14B
R7031	B	C	17B
R7032	B	C	17B
R7033	A	D	8B
R7034	B	C	1B
R7035	B	C	6B
R7036	B	C	7B
R7037	B	C	7B
R7038	B	C	7B
R7050	A	D	14B
R7051	A	D	14A
R7052	B	C	13B
R7053	B	C	15A
R7054	B	C	10B
R7101	B	C	15P
R7102	A	D	19N
R7103	B	C	11P
R7104	B	C	11P
R7105	B	C	18P
R7106	B	C	18P
R7107	B	C	14P
R7108	B	C	14P
R7109	B	C	17N
R7110	B	C	19P
R7111	B	C	20L
R7112	B	C	15P
R7113	B	C	18N
R7114	B	C	21A
R7115	A	D	20B
R7118	B	C	18L
R7119	B	C	18L
R7120	A	D	17N
R7121	B	C	19M
R7122	B	C	18M
R7123	B	C	18M
R7124	B	C	18N
R7125	B	C	20M
R7126	B	C	20L
R7127	B	C	19L
R7128	B	C	20L
R7129	A	D	20L
R7131	B	C	20L
R7132	B	C	20K
R7133	B	C	20K
R7134	B	C	20K
R7135	B	C	20K
R7136	B	C	21L
R7137	B	C	21M
R7139	B	C	20N
R7151	B	C	19P
R7152	B	C	20P
R7153	B	C	21P
R7154	A	D	20P
R7155	B	C	18L
R7156	B	C	18M
R7157	A	D	18M
R7158	A	D	18L
R7159	B	C	18M
R7160	B	C	18M
SWITCH			
S3001	A	D	18C
S3002	A	D	18F
S7001	A	D	22B
S7002	A	D	18B
S7003	A	D	16B
S7004	A	D	7B
S7005	A	D	6B
S7006	A	D	6B
S7008	A	D	5B
S7010	A	D	4B
S7011	A	D	4B
S7012	A	D	3B
S7013	A	D	2B
S7014	A	D	2B
S7015	A	D	1B
S7016	A	D	17B
TEST POINT			
TP106	A	D	22C
TP111	A	D	22B
TP2033	A	D	8P
TP4001	A	D	7P
TP7001	A	D	7A
TP7002	A	D	17A
OTHERS			
BT3001	A	D	3C
CF3301	A	D	16C
F5001	A	D	2P
FL151	A	D	10M
FW7001	A	D	18B
FW7006	A	D	4C
FW7101	A	D	20I
FW7102	A	D	18O
J7101	A	D	16P
J7102	A	D	12P
J7103	A	D	21A
J7104	A	D	19A
J7151	A	D	20Q
J7152	A	D	21Q
J7153	A	D	18P
K5101	A	D	3K
LF5001	A	D	4O
LF5002	A	D	2N
PC5101	A	D	4L
PC5301	A	D	2D
PS3001	A	D	16F
PS3002	A	D	8G
T2051	A	D	10O
T5001	A	D	1K
TU6001	A	D	22P
X1	A	D	16L
X2	A	D	16L
X3001	A	D	14D
X3002	A	D	14D
X3302	A	D	17C

4.10 FDP GRID ASSIGNMENT AND ANODE CONNECTION

GRID ASSIGNMENT


5G
4G
3G
2G
1G
VPS/PDC
SVHS
VN ⇨ LD
SP S L:P
3倍 VCR
標準 ビデオ
2a
1a
2
h
1
h
col2
col1
REVIEW
2a
1a
f
b
1a
e
c
1d
B9
B1
S3
S2
S1
(5G)

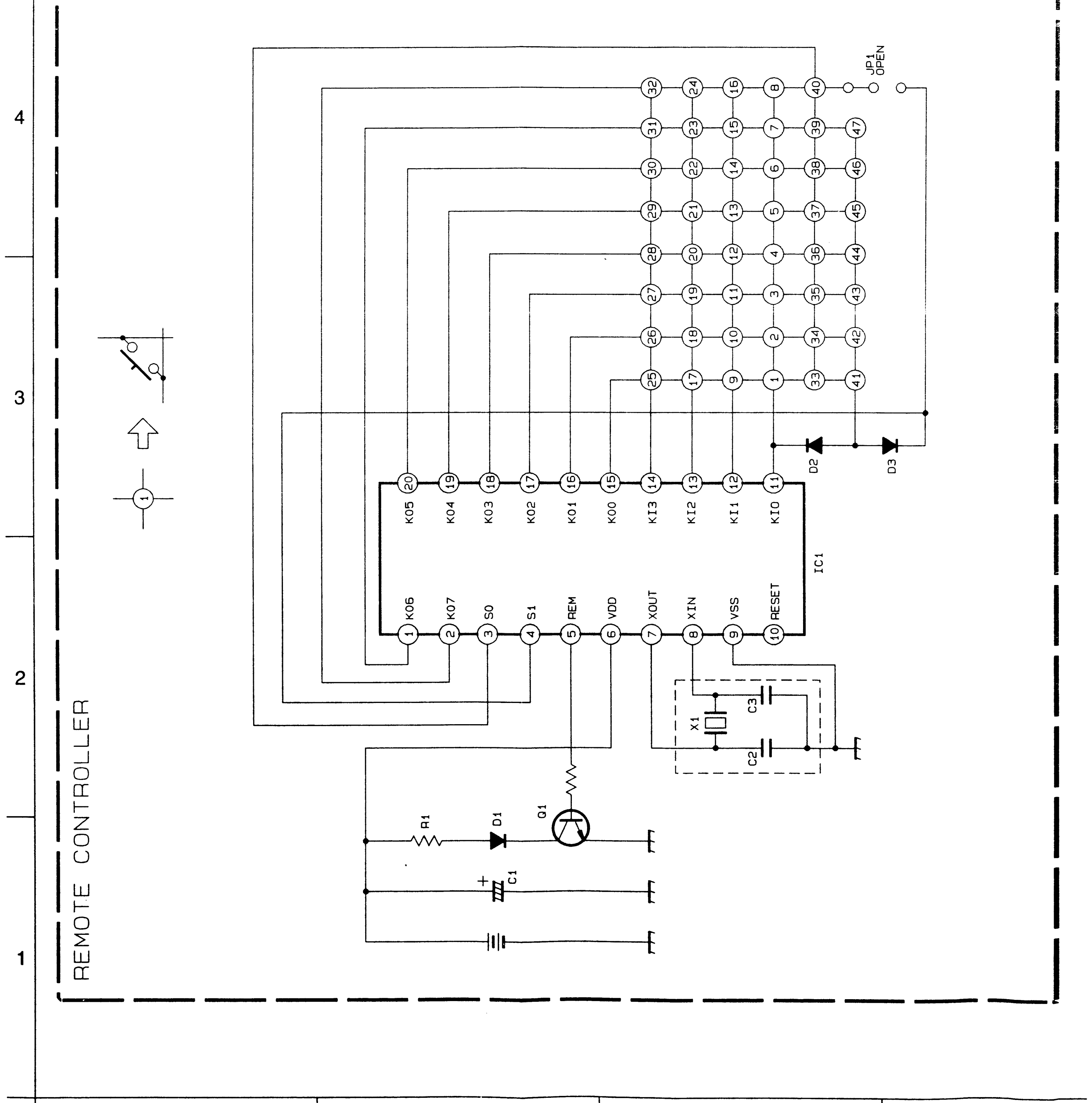
ANODE CONNECTION

	5G	4G	3G	2G	1G
P 1	S2	⊢⇨	1a	1a	1a
P 2	S1	⇨|	1b	1b	1b
P 3	S3	3倍	1f	1f	1f
P 4	VPS/PDC	標準	1g	1g	1g
P 5	SVHS	◷	1c	1c	1c
P 6	—	◺	1e	1e	1e
P 7	—	🖭	1d	1d	1d
P 8	B9	VCR	col2	1h	1h
P 9	B8	ビデオ	2a	2a	2a
P10	B7	⇨	2b	2b	2b
P11	B6	VN	2f	2f	2f
P12	B5	LD	2g	2g	2g
P13	B4	SP	2c	2c	2c
P14	B3	S (SEP)	2e	2e	2e
P15	B2	: (SEP)	2d	2d	2d
P16	B1	LP (SEP)	2h	col1	REVIEW

4.11 REMOTE CONTROL SCHEMATIC DIAGRAM

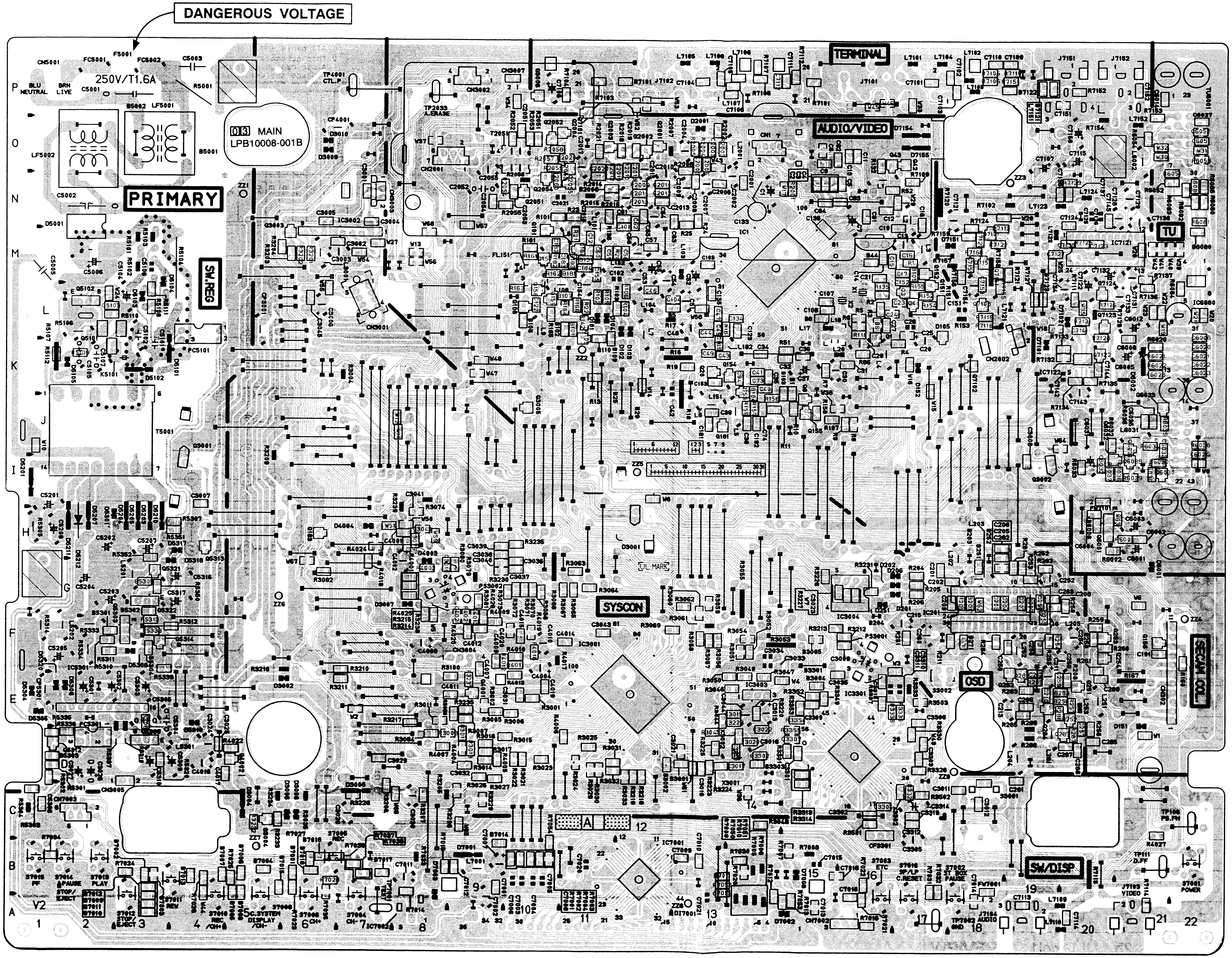
NOTES:
1. All parts shown in this schematic are critical for safety.
2. This schematic is only for reference.
Avoid replacing individual parts.
Replace the entire unit only.

Key No.	Key Name
1	8
2	TIMER
3	9
4	4
5	2
6	5
7	6
8	7
9	DATE-
10	PROG(CH)-
11	DATE+
12	CANCEL
13	0
14	STOP+
15	PROG(CH)+
16	START+
17	-/-MAIN/SUB
18	>>/TV_VOL+
19	OPERATE
20	/TV_PROG-
21	AUDIO/MUTE
22	TV/VCR
23	/TV_PROG+
24	<</TV_VOL-
25	TV
27	DISPLAY
28	1
29	C.MEMORY
30	ENTER/OSD
31	3
32	RE-VIEW
33	REC
34	SKIP
35	PROG_CHECK
36	START-
37	STOP-
38	PROG
39	PAUSE
40	PLAY
41	STOP
43	OK
45	MENU
46	REW
47	FF
33+39	REC_PAUSE
33+40	REC_START

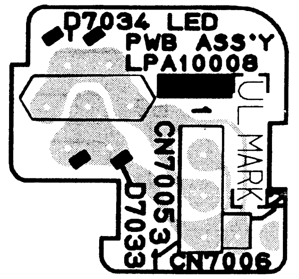

5
4
3
2
1
JP1
OPEN
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
D2
D3
KO5
KO4
KO3
KO2
KO1
KO0
KI3
KI2
KI1
KI0
IC1
KO6
KO7
SO
S1
REM
VDD
XOUT
XIN
VSS
RESET
X1
C3
C2
R1
D1
Q1
C1
REMOTE CONTROLLER

A B C D

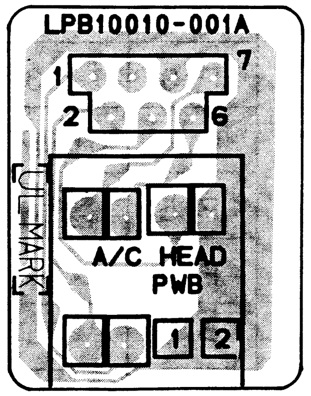
4.9 MAIN AND A/C HEAD CIRCUIT BOARDS


DANGEROUS VOLTAGE
F5001
250V/T1.6A
BLU NEUTRAL
BRN LIVE
0B MAIN
LPB10008-001B
PRIMARY
SW.REG
TERMINAL
AUDIO/VIDEO
TU
SYSCON
OSD
SECAM COL.
SW/DISP
T5001
UL MARK
P
O
N
M
L
K
J
I
H
G
F
E
C
B
A
V2
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
S7015 FF
S7014 PAUSE STOP/EJECT
S7013 PLAY
S7012 STOP/EJECT
S7011 REW
S7010 REC /CH+
C.SYSTEM DISPLAY /CH-
S7006 CH+
S7004 CH-
TP7002 GND
J7104 AUDIO
J7103 VIDEO
S7001 POWER
S7002 ST. BOX PAUSE
S7003 ETC
S7016 SP/LP C.RESET
TP111 D.FF
TP106 PB.FM
TP4001 CTL.P
TP2033 A.ERASE

— LED —


D7034 LED
PWB ASS'Y
LPA10008
CN7005
D7033
CN7006
UL MARK

— A/C HEAD —


LPB10010-001A
1
2
7
6
UL MARK
A/C HEAD
PWB
1
2

4.12 VOLTAGE CHARTS

<VIDEO/N.AUDIO>

MODE PIN NO.	REC	PLAY
IC1		
1	2.4	2.4
2	2.4	2.4
3	0	0
4	2.5	2.5
5	0	0
6	0.4	0.9
7	2.4	2.4
8	2.4	2.4
9	2.4	2.4
10	2.5	2.5
11	2.5	2.5
12	4.9	4.9
13	1.8	1.6
14	1.8	1.5
15	2.6	2.8
16	2.0	0.8
17	0	0
18	2.2	2.1
19	3.0	3.0
20	2.7	2.7
21	2.4	2.3
22	2.3	2.0
23	3.0	2.9
24	2.1	2.1
25	1.4	1.4
26	2.1	2.1
27	0	0
28	3.0	2.9
29	1.9	1.8
30	2.7	2.8
31	2.8	2.7
32	0	0
33	0	0
34	0	0
35	3.1	3.0
36	5.1	5.0
37	0	0
38	5.1	5.1
39	3.1	3.1
40	5.0	5.1
41	5.1	5.1
42	2.0	2.1
43	5.1	5.0
44	2.6	2.6
45	0	0
46	2.0	2.1
47	0	0
48	0	0
49	0	0
50	0.3	0.3
51	0	0
52	2.4	2.4
53	2.7	2.8
54	1.9	2.0
55	2.1	2.2
56	2.7	2.8
57	0	0
58	3.1	3.2
59	2.8	2.8
60	2.1	2.1
61	5.0	5.0
62	4.9	4.9
63	4.9	4.9
64	–	–
65	0	0
66	5.0	5.0
67	5.0	5.0
68	0	0
69	2.8	2.7
70	2.6	2.6
71	–	–
72	2.2	2.2
73	–	–
74	2.6	1.0
75	–	–
76	2.5	2.5
77	4.9	4.7
78	2.7	2.8
79	4.1	2.2
80	0	0
81	2.5	2.7
82	1.2	1.2
83	2.5	2.5
84	0	2.8
85	0	0
86	2.1	2.2
87	2.2	2.2
88	2.3	2.2
89	2.3	2.2
90	5.0	5.0
91	–	–
92	–	–
93	–	–
94	–	–
95	2.8	2.8
96	5.1	5.1
97	0	0
98	2.1	2.4
99	0.6	2.6
100	2.4	2.4
Q1		
E	1.9	1.9
C	5.0	5.0
B	2.5	2.5
Q2001		
E	-12.0	0
C	0	0
B	-21.3	0.7
Q2002		
E	-12.1	0
C	0	0
B	-21.0	0.7
Q2003		
E	5.1	5.0
C	-21.0	5.0
B	5.1	0
Q2051		
E	0	0
C	8.3	0
B	0.4	0.3
Q2052		
E	11.5	11.6
C	11.4	2.9
B	10.8	11.5
Q2053		
E	0	0
C	0	11.5
B	5.1	0
Q2054		
E	11.4	2.9
C	11.2	0.3
B	10.6	3.0
Q2055		
E	0	0
C	0	2.9
B	5.0	0
CN1		
1	0	0
2	0	0
3	0.5	0
4	0.5	0
5	2.2	2.2
6	2.2	2.2
7	2.1	2.2
8	2.1	2.2
CN2001		
1	0	0
2	0	0
3	0	0
4	0	0
5	0	0
6	2.3	2.4
7	2.5	2.5
CN2002		
1	0	0
2	0	0

<ON SCREEN>

MODE PIN NO.	REC	PLAY
IC201		
1	0	0
2	2.8	2.8
3	5.1	5.1
4	0	0
5	–	–
6	4.9	4.9
7	4.9	4.9
8	5.1	5.1
9	1.6	1.6
10	4.7	4.7
11	4.4	4.5
12	5.1	5.1
13	2.9	2.9
14	3.0	2.9
15	0	0
16	1.2	1.2
17	2.6	2.6
18	5.1	5.1
19	2.4	2.4
20	0	0
21	2.4	2.4
22	1.5	1.3
23	5.1	5.1
24	3.0	3.0
25	2.5	2.5
26	–	–
27	5.1	5.1
28	3.8	3.8
29	5.1	5.1
30	5.1	5.1
Q253		
E	1.8	1.8
C	5.1	5.1
B	2.4	2.4
Q254		
E	2.4	2.4
C	0	0
B	1.8	1.8
IC3001		

<SYSCON>

MODE PIN NO.	REC	PLAY
1	4.7	4.6
2	4.9	4.6
3	5.1	5.1
4	4.8	4.7
5	4.9	4.8
6	4.8	4.8
7	4.1	4.1
8	0	0
9	0	2.6
10	4.7	2.8
11	0	0
12	0	0
13	5.1	0
14	4.8	5.1
15	5.1	0
16	5.1	5.0
17	1.9	0
18	2.7	2.6
19	0	2.4
20	–	–
21	0	0
22	0	0
23	0	0
24	0	0
25	0	0
26	0	0
27	0	0
28	0	0
29	0	0
30	5.1	5.1
31	5.1	4.8
32	5.1	5.1
33	0	0
34	0	0
35	0	0
36	5.1	5.1
37	5.1	5.1
38	–	–
39	–	–
40	0	0
41	–	–
42	–	–
43	5.2	5.1
44	5.1	5.1
45	0	0
46	0	0
47	0	0
48	5.1	5.1
49	0	0
50	0	5.1
51	5.1	5.1
52	5.1	5.1
53	0	0
54	0	0
55	0	0
56	0	0
57	–	–
58	5.3	5.1
59	0	0
60	0	0
61	4.1	4.1
62	0	5.2
63	0	0
64	1.0	1.0
65	1.0	1.0
66	0.8	0.8
67	5.0	5.0
68	4.5	4.4
69	5.1	5.1
70	4.7	4.7
71	4.9	4.9
72	4.9	4.9
73	5.2	5.2
74	0	0
75	–	–
76	5.1	5.1
77	2.5	2.5
78	1.3	1.3
79	–	–
80	–	–
81	0	0
82	0	0
83	0	1.2
84	0.7	0.7
85	2.4	2.5
86	0.7	0.5
87	1.9	1.9
88	1.6	0
89	2.4	2.5
90	2.4	2.5
91	2.0	2.5
92	3.0	2.5
93	2.3	2.4
94	2.5	2.4
95	2.4	2.4
96	2.4	2.5
97	2.3	2.4
98	4.9	4.9
99	4.9	4.9
100	0	0
IC3002		
1	0	0
2	12.3	12.3
3	0.7	0.5
4	–	–
5	0	0
6	12.3	12.3
7	0	0
8	12.3	12.3
9	0	0
IC3003		
1	5.2	5.2
2	5.1	5.1
3	0	0
IC3004		
1	0	0
2	0	0
3	0	0
4	0	0
5	5.0	5.0
6	5.0	5.0
7	0	0
8	5.2	5.2
IC3301		
1	–	–
2	1.0	1.0
3	–	–
4	–	–
5	–	–
6	–	–
7	–	–
8	–	–
9	–	–
10	–	–
11	–	–
12	–	–

MODE PIN NO.	REC	PLAY
13	0	0
14	0	0
15	5.1	5.1
16	–	–
17	–	–
18	–	–
19	–	–
20	–	–
21	0	0
22	0	0
23	5.2	5.2
24	–	–
25	–	–
26	–	–
27	–	–
28	5.1	5.1
29	–	–
30	4.1	4.1
31	0	0
32	0	0
33	0	0
34	–	–
35	1.1	1.1
36	1.1	1.1
37	0	0
38	–	–
39	–	–
40	–	–
41	–	–
42	–	–
43	–	–
44	–	–
45	–	–
46	–	–
47	–	–
48	–	–
49	5.1	5.1
50	–	–
51	0	0
52	0	0
53	4.7	4.7
54	5.0	5.0
55	0.8	0.8
56	–	–
Q3001		
E	0	0
C	5.0	4.8
B	–	–
Q3002		
E	0	0
C	5.0	4.9
B	–	–
Q3003		
E	0	0
C	12.3	12.3
B	0	0
Q3004		
E	0	0
C	0	0
B	0.7	0.7
Q3006		
E	0	0
C	5.1	5.1
B	0	0
Q4001		
E	0	0
C	0	0
B	5.1	5.1

MODE PIN NO.	REC	PLAY
Q4002		
E	4.9	4.9
C	5.8	5.8
B	5.6	5.6
CN3001		
1	0	0
2	2.5	2.5
3	2.4	2.4
4	5.1	5.1
5	0	0
6	5.1	5.1
7	–	–
8	12.3	12.3
CN3002		
1	1.5	1.5
2	0.4	0.4
3	11.6	11.6
4	1.9	1.9
5	0	0
CN3003		
1	0	0
2	0	0
CN3004		
1	5.2	5.2
2	5.2	5.2
3	0	0
4	0	0
CN3005		
1	5.2	5.2
2	5.1	5.1

<SWITCHING REGULATOR>

MODE PIN NO.	REC	PLAY
IC5301		
1	6.1	6.1
2	5.1	5.1
3	4.9	4.9
4	0	0
5	12.3	12.3
6	11.6	11.6
7	12.3	12.3
8	12.3	12.3
9	1.3	1.3
10	11.1	11.1
Q5101		
S	–	–
D	113.4	113.4
G	–	–
Q5102		
E	–	–
C	–	–
B	–	–
Q5306		
E	5.3	5.2
C	6.1	6.1
B	5.9	5.9
Q5322		
E	11.7	11.7
C	12.3	12.3
B	12.3	12.3

<TUNER>

MODE PIN NO.	REC	PLAY
IC6080		
1	1.1	1.1
2	1.8	1.8
3	4.8	4.8
4	0	0
5	8.1	8.1
6	8.1	8.1
7	8.1	8.1
8	9.0	9.0
Q6001		
E	9.1	9.1
C	11.6	11.6
B	9.7	9.7
Q6031		
E	0	0
C	0	0
B	3.8	3.8
Q6032		
E	0	0
C	0.4	0.3
B	3.7	3.8

<SW/DISPLAY>

MODE PIN NO.	REC	PLAY
IC7001		
1	5.2	5.2
2	2.1	2.1
3	0	0
4	2.1	2.1
5	5.1	5.1
6	4.1	4.1
7	5.2	5.1
8	5.1	5.1
9	5.1	5.1
10	4.6	4.5
11	5.1	5.1
12	4.1	4.1
13	4.5	4.5
14	5.1	5.1
15	4.7	4.7
16	-28.8	-28.7
17	-28.8	-28.7
18	-28.5	-28.4
19	–	–
20	–	–
21	–	–
22	–	–
23	–	–
24	–	–
25	–	–
26	–	–
27	–	–
28	–	–
29	–	–
30	–	–
31	–	–
32	–	–
33	–	–
34	–	–
35	–	–
36	–	–
37	–	–
38	–	–

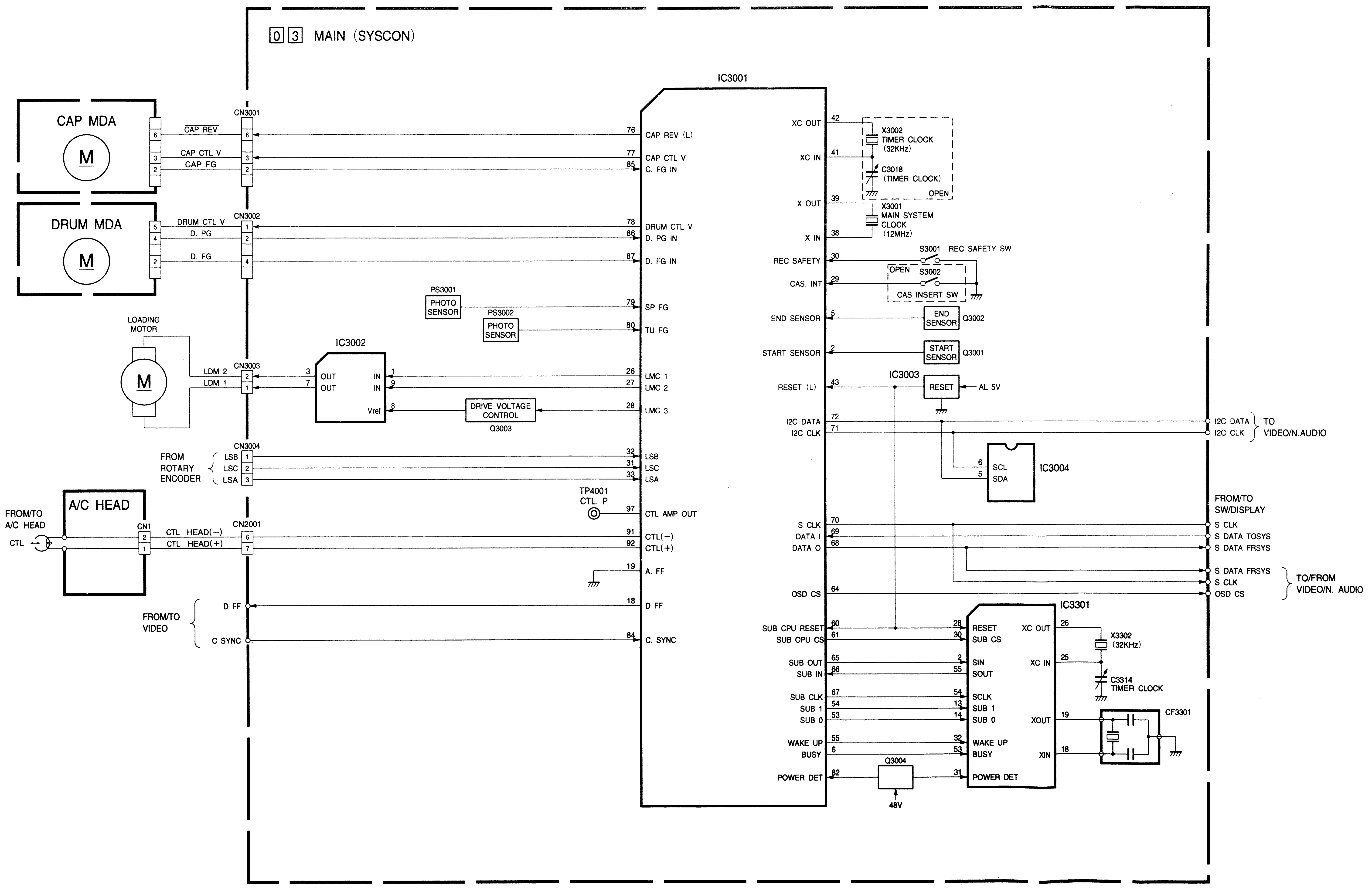
MODE PIN NO.	REC	PLAY
39	–	–
40	–	–
41	–	–
42	–	–
43	–	–
44	5.1	5.1
IC7002		
1	5.1	5.1
2	5.1	5.1
3	0	0
CN7002		
1	-0.9	-0.8
2	0	0
3	–	–

<TERMINAL>

MODE PIN NO.	REC	PLAY
IC7121		
1	1.6	1.6
2	0	0
3	1.6	1.6
4	11.7	11.7
5	2.0	2.0
6	0	0
7	5.1	5.1
8	11.6	11.6
9	5.2	5.2
10	1.0	1.0
11	5.1	5.2
12	–	–
13	5.0	5.0
14	5.0	5.0
15	5.9	5.8
16	5.2	5.2
17	5.8	5.8
18	5.1	5.2
19	11.7	11.7
20	2.6	2.6
21	–	–
22	1.4	1.4
23	2.6	2.6
24	2.0	2.0
IC7122		
1	2.5	2.5
2	2.5	2.5
3	2.5	2.5
4	0	0
5	2.5	2.5
6	2.5	2.5
7	2.5	2.5
8	5.0	5.0
Q7121		
E	3.0	3.0
C	0	0
B	2.4	2.4
Q7122		
E	0	0
C	5.2	5.2
B	0	0
Q7123		
E	5.2	5.2
C	-1.0	-1.0
B	5.2	5.2

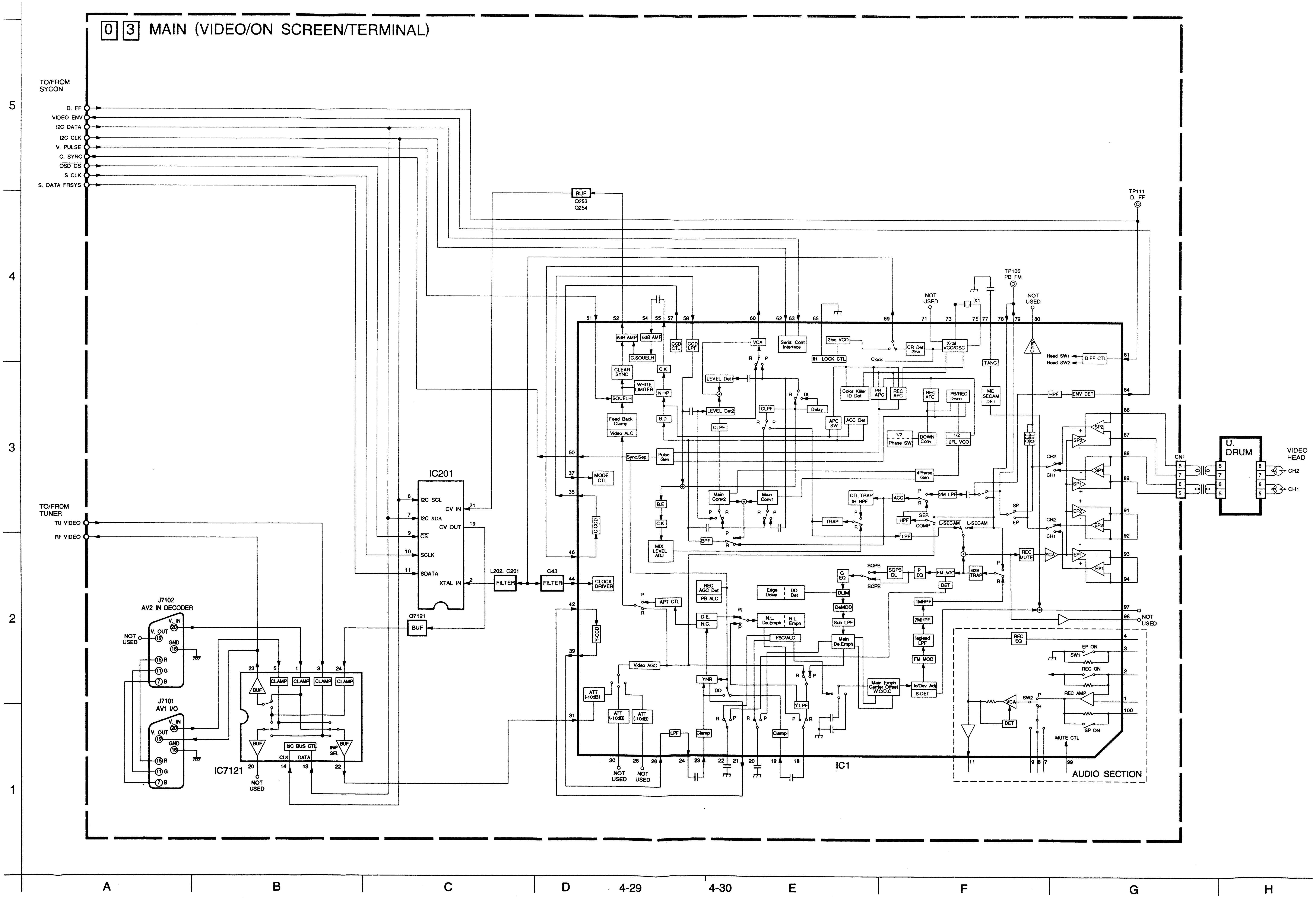
MODE PIN NO.	REC	PLAY
Q7124		
E	0	0
C	0	0
B	-1.0	-1.0
J7101		
1	0	0
2	0	0
3	0	0
4	0	0
5	0	0
6	0	0
7	0	0
8	11.6	11.6
9	0	0
10	–	–
11	0	0
12	–	–
13	0	0
14	0	0
15	0	0
16	0	0
17	0	0
18	0	0
19	1.3	1.3
20	0	0
21	0	0
J7102		
1	2.6	3.0
2	1.8	2.2
3	2.6	3.0
4	0	0
5	0	0
6	1.7	2.1
7	0	0
8	0	0
9	0	0
10	–	–
11	0	0
12	–	–
13	0	0
14	0	0
15	0	0
16	0	0
17	0	0
18	0	0
19	2.6	2.6
20	0	0
21	0	0

4.13 SYSTEM CONTROL BLOCK DIAGRAM

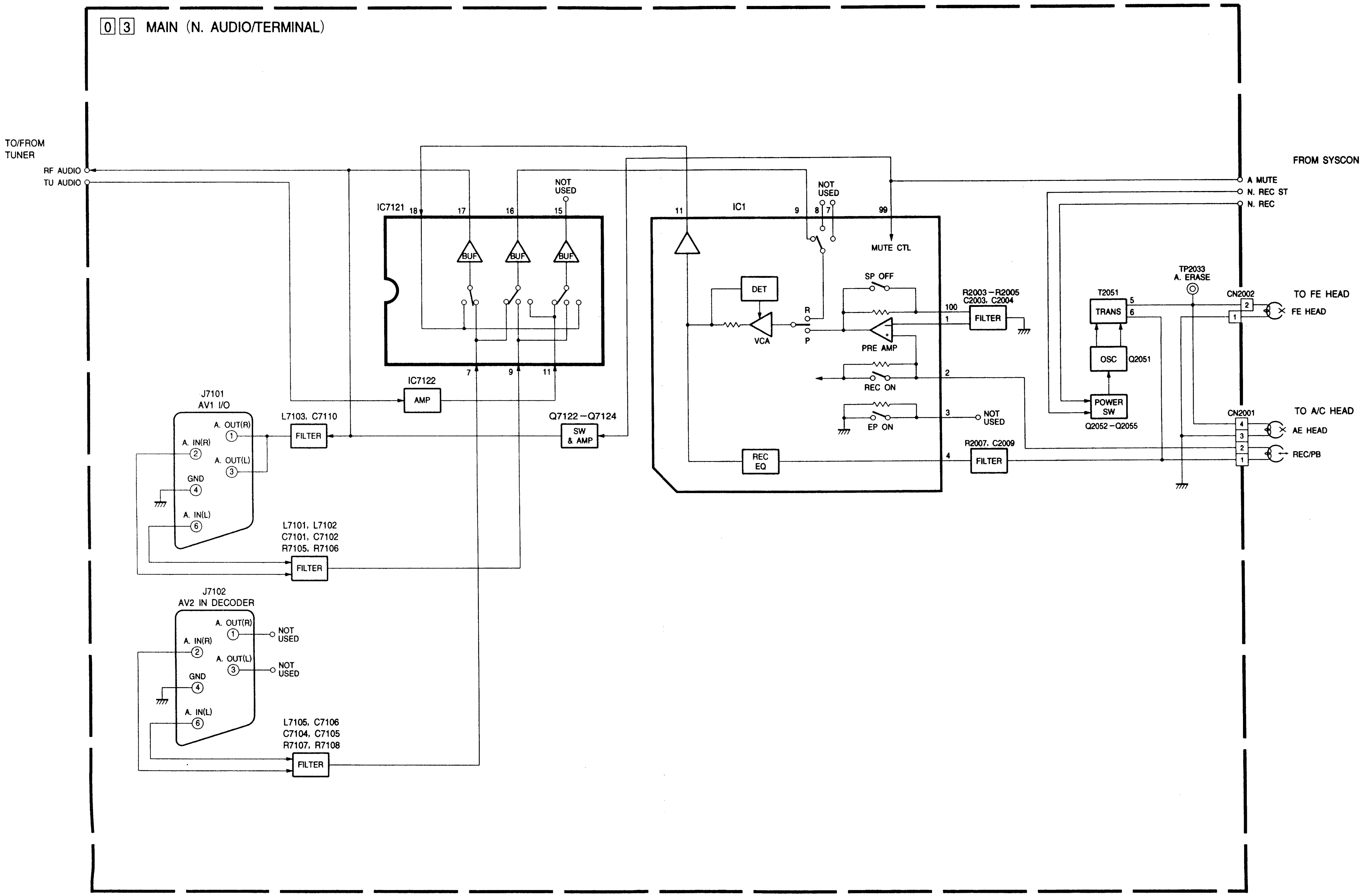


03 MAIN (SYSCON)
IC3001
CAP MDA
M
CN3001
CAP REV
CAP CTL V
CAP FG
DRUM MDA
CN3002
DRUM CTL V
D. PG
D. FG
LOADING MOTOR
LDM 2
LDM 1
CN3003
IC3002
OUT
OUT
IN
IN
Vref
PS3001
PHOTO SENSOR
PS3002
PHOTO SENSOR
DRIVE VOLTAGE CONTROL
Q3003
FROM ROTARY ENCODER
CN3004
LSB
LSC
LSA
TP4001
CTL. P
A/C HEAD
FROM/TO A/C HEAD
CTL
CN1
CTL HEAD(−)
CTL HEAD(+)
CN2001
FROM/TO VIDEO
D FF
C SYNC
CAP REV (L)
CAP CTL V
C. FG IN
DRUM CTL V
D. PG IN
D. FG IN
SP FG
TU FG
LMC 1
LMC 2
LMC 3
LSB
LSC
LSA
CTL AMP OUT
CTL(−)
CTL(+)
A. FF
D FF
C. SYNC
XC OUT
XC IN
X OUT
X IN
REC SAFETY
CAS. INT
END SENSOR
START SENSOR
RESET (L)
I2C DATA
I2C CLK
S CLK
DATA I
DATA O
OSD CS
SUB CPU RESET
SUB CPU CS
SUB OUT
SUB IN
SUB CLK
SUB 1
SUB 0
WAKE UP
BUSY
POWER DET
X3002
TIMER CLOCK (32KHz)
C3018 (TIMER CLOCK)
OPEN
X3001
MAIN SYSTEM CLOCK (12MHz)
S3001 REC SAFETY SW
OPEN S3002
CAS INSERT SW
END SENSOR Q3002
START SENSOR Q3001
IC3003
RESET
AL 5V
IC3004
SCL
SDA
I2C DATA
I2C CLK
TO VIDEO/N.AUDIO
FROM/TO SW/DISPLAY
S CLK
S DATA TOSYS
S DATA FRSYS
S DATA FRSYS
S CLK
OSD CS
TO/FROM VIDEO/N. AUDIO
IC3301
RESET
SUB CS
SIN
SOUT
SCLK
SUB 1
SUB 0
WAKE UP
BUSY
POWER DET
XC OUT
XC IN
XOUT
XIN
X3302 (32KHz)
C3314 TIMER CLOCK
CF3301
Q3004
48V
5
4
3
2
1
A
B
C
D
E
F
G
H

4.14 VIDEO BLOCK DIAGRAM


0 3 MAIN (VIDEO/ON SCREEN/TERMINAL)
TO/FROM SYCON
D. FF
VIDEO ENV
I2C DATA
I2C CLK
V. PULSE
C. SYNC
OSD CS
S CLK
S. DATA FRSYS
TO/FROM TUNER
TU VIDEO
RF VIDEO
J7102 AV2 IN DECODER
J7101 AV1 I/O
V. IN
V. OUT
GND
R
G
B
NOT USED
IC7121
BUF
CLAMP
I2C BUS CTL
CLK
DATA
INP SEL
Q7121
IC201
I2C SCL
I2C SDA
CS
SCLK
SDATA
CV IN
CV OUT
XTAL IN
L202, C201
FILTER
C43
CLOCK DRIVER
MODE CTL
C-CCD
Y-CCD
BUF
Q253
Q254
TP111 D. FF
TP106 PB FM
X1
IC1
6dB AMP
C.SOUELH
CLEAR SYNC
WHITE LIMITER
SOUELH
Feed Back Clamp
Video ALC
Sync.Sep
Pulse Gen.
CCD CTL
CCD LPF
C.K
N→P
B.D
VCA
LEVEL Det1
LEVEL Det2
CLPF
Delay
Serial Cont Interface
2fsc VCO
fH LOCK CTL
CR Det. 2fsc
Clock
X-tal VCO/OSC
Color Killer ID Det.
PB APC
REC APC
APC SW
ACC Det
REC AFC
PB/REC Discri
1/2 Phase SW
DOWN Conv.
1/2 2FL VCO
4Phase Gen.
TANC
ME SECAM DET
Comp
D.FF CTL
Head SW1
Head SW2
HPF
ENV DET
Main Conv2
Main Conv1
B.E
MIX LEVEL ADJ
BPF
TRAP
CTL TRAP fH HPF
ACC
2M LPF
SEP.
COMP
L-SECAM
LPF
REC MUTE
YCA
629 TRAP
FM AGC
DET
P EQ
SQPB DL
G EQ
SQPB
Edge Delay
DO Det
DLIM
DeMOD
Sub LPF
REC AGC Det
PB ALC
APT CTL
D.E.
N.C.
N.L. De.Emph
N.L. Emph
FBC/ALC
Main De.Emph
Video AGC
ATT (-10dB)
YNR
DO
Clamp
Y.LPF
Main Emph Carrier Offset W.C/D.C
fo/Dev Adj
S-DET
FM MOD
lagilead LPF
7MHPF
1MHPF
SP1
SP2
EP1
EP2
CH1
CH2
SP
EP
REC EQ
EP ON
SW1
REC ON
REC AMP
SW2
VCA
SP ON
MUTE CTL
AUDIO SECTION
CN1
U. DRUM
VIDEO HEAD
NOT USED
1
2
3
4
5
A
B
C
D
E
F
G
H

4.15 AUDIO BLOCK DIAGRAM



0 3 MAIN (N. AUDIO/TERMINAL)
TO/FROM TUNER
RF AUDIO
TU AUDIO
IC7121
18
17
16
15
NOT USED
BUF
BUF
BUF
7
9
11
IC7122
AMP
J7101
AV1 I/O
A. OUT(R)
①
A. IN(R)
②
A. OUT(L)
③
GND
④
A. IN(L)
⑥
L7103, C7110
FILTER
Q7122 – Q7124
SW & AMP
L7101, L7102
C7101, C7102
R7105, R7106
FILTER
J7102
AV2 IN DECODER
A. OUT(R)
①
NOT USED
A. IN(R)
②
A. OUT(L)
③
NOT USED
GND
④
A. IN(L)
⑥
L7105, C7106
C7104, C7105
R7107, R7108
FILTER
IC1
11
9
8
7
NOT USED
99
MUTE CTL
DET
VCA
R
P
SP OFF
PRE AMP
REC ON
EP ON
REC EQ
100
1
2
3
4
NOT USED
R2003 – R2005
C2003, C2004
FILTER
R2007, C2009
FILTER
FROM SYSCON
A MUTE
N. REC ST
N. REC
TP2033
A. ERASE
T2051
TRANS
5
6
OSC
Q2051
POWER SW
Q2052 – Q2055
CN2002
2
1
TO FE HEAD
FE HEAD
CN2001
4
3
2
1
TO A/C HEAD
AE HEAD
REC/PB
5
4
3
2
1

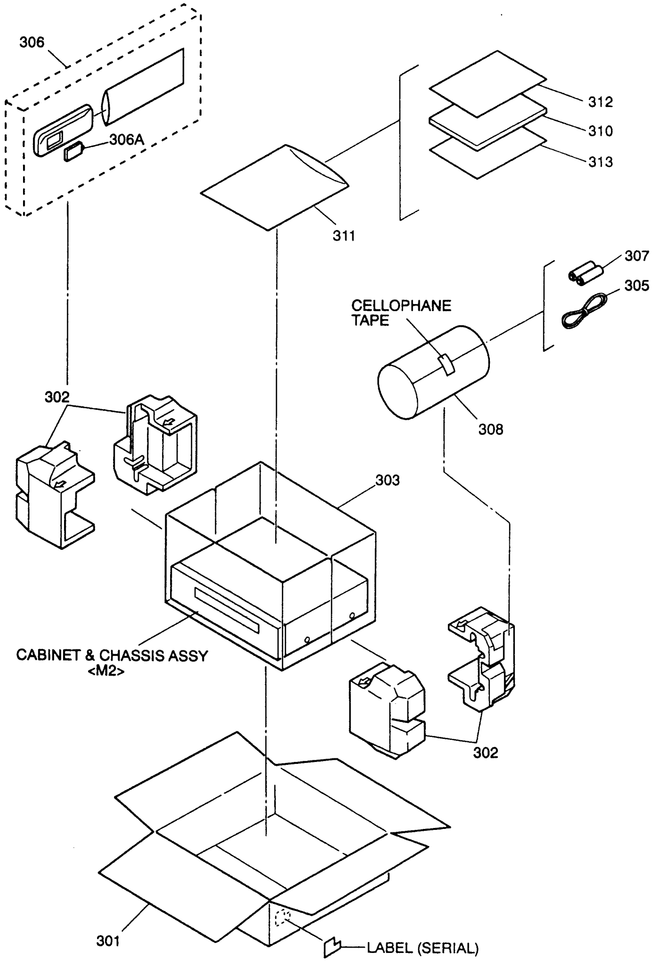
SECTION 5
PARTS LIST

SAFETY PRECAUTION

Parts identified by the ⚠ symbol are critical for safety. Replace only with specified part numbers.

5.1 PACKING AND ACCESSORY ASSEMBLY <M1>

The instruction manual to be provided with this product will differ according to the destination.


306
306A
312
310
313
311
307
305
CELLOPHANE TAPE
308
302
303
CABINET & CHASSIS ASSY <M2>
302
301
LABEL (SERIAL)

****

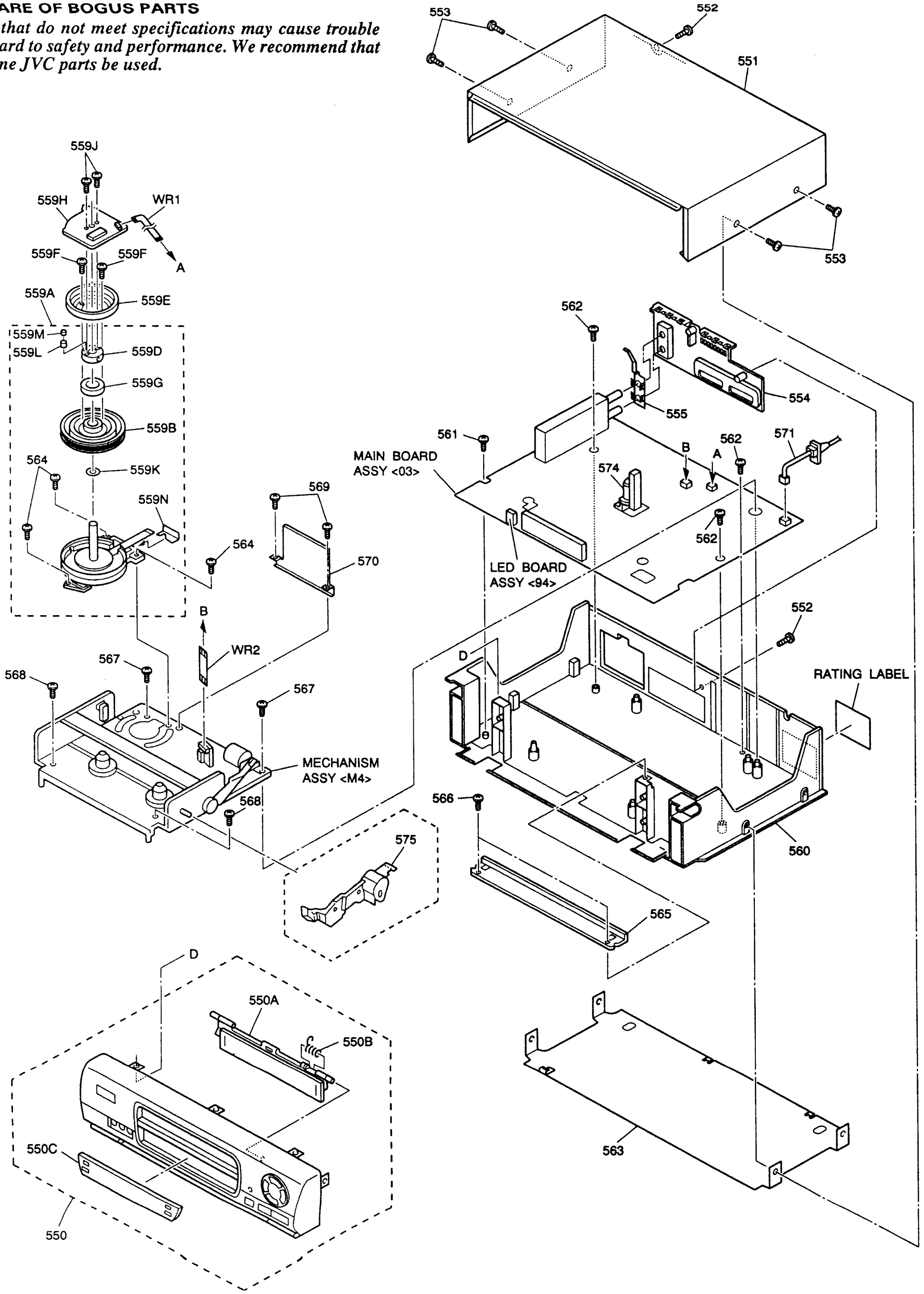
PACKING AND ACCESSORY ASSEMBLY <M1>

# ⚠	REF No.	PART No.	PART NAME, DESCRIPTION
	301	LP30354-005B	PACKING CASE,J255EK
		LP30354-009B	PACKING CASE,J255ES
	302	LP30355-001A	CUSHION ASSY
	303	PQM30021-93	POLY BAG
	305	PEAC0300-02	RF CABLE
	306	LP20303-003A	REMOTE CONTROLLER
	306A	LP40225-002A	COVER(BATTERY)
	307	R6PRPA-2ST	BATTERY,X2
	308	QPC02202215P	POLY BAG
⚠	310	LPT0041-001A	INST.BOOK(EN)
	311	QPC02503515P	POLY BAG
	312	BT-54008-1	GUARANTEE CARD
	313	BT-20066A	E.DISTRI.LIST,J255EK

5.2 CABINET AND CHASSIS ASSEMBLY <M2>

BEWARE OF BOGUS PARTS

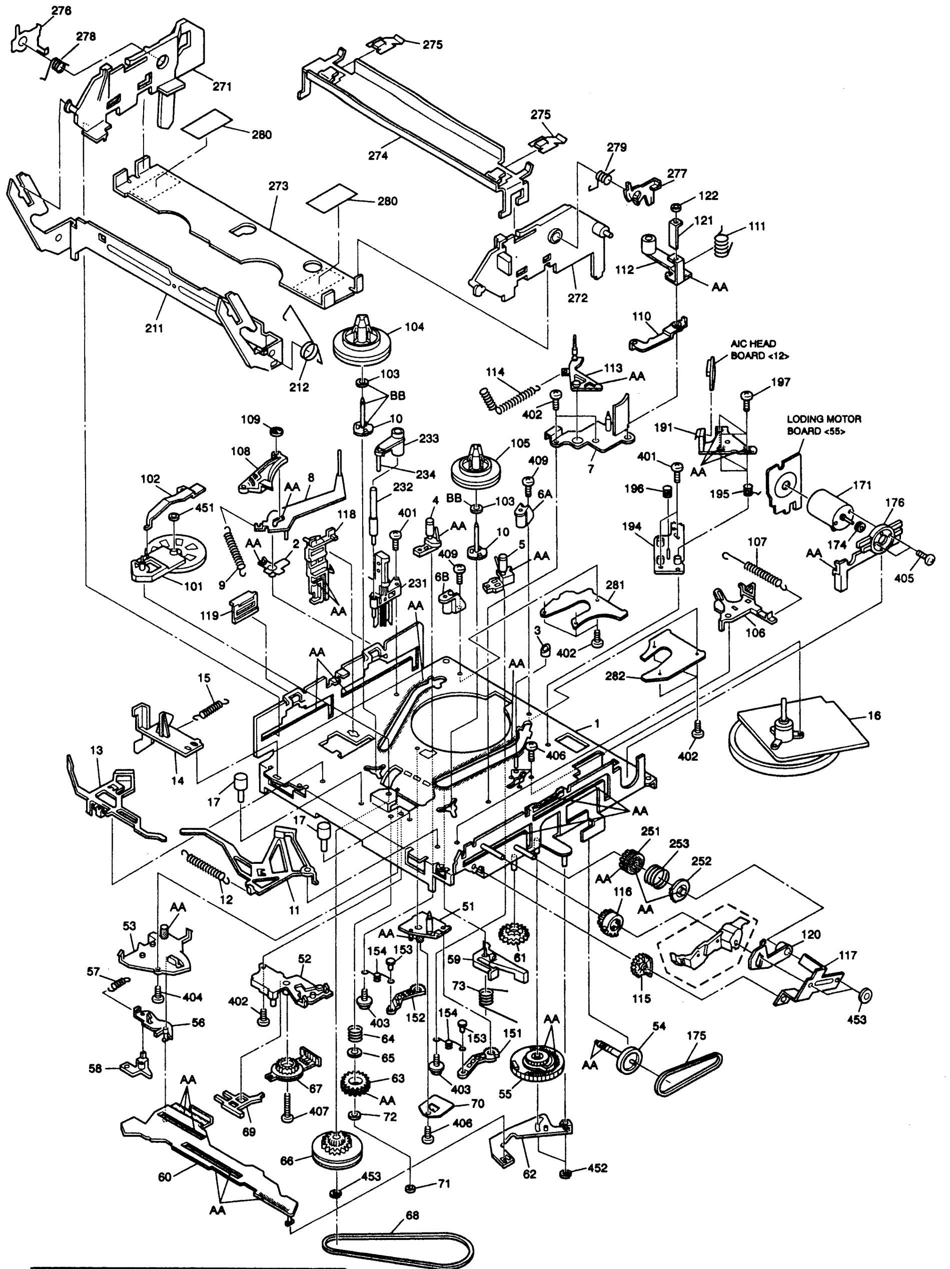
Parts that do not meet specifications may cause trouble in regard to safety and performance. We recommend that genuine JVC parts be used.


553
552
551
553
559J
559H
WR1
559F
559F
A
559A
559E
559M
559L
559D
559G
559B
564
559K
559N
564
569
570
B
WR2
567
568
567
MECHANISM ASSY <M4>
568
575
562
555
554
561
MAIN BOARD ASSY <03>
574
B
A
562
571
562
LED BOARD ASSY <94>
552
D
RATING LABEL
566
560
565
D
550A
550B
550C
550
563

# ⚠ REF No.	PART No.	PART NAME, DESCRIPTION
******************************		
CABINET AND CHASSIS ASSEMBLY <M2>		
550	LP10119-003C	FRONT PANEL ASSY,J255EK
	LP10119-013A	FRONT PANEL ASSY,J255ES
550A	PQ21884-57	CASSETTE DOOR
550B	PQ46448	TORSION SPRING
550C	LP20326-003A	DISPLAY WINDOW
⚠ 551	LP10013-005B	TOP COVER
552	QYTDSF3010M	SCREW,X2 TOP COVER(REAR)
553	QYTDSF3010M	SCREW,X4 TOP COVER(SIDE)
⚠ 554	LP20317-001B	TERM.BOARD
555	PQ21623-2	EARTH PLATE(RF)
559A	LP20371-004A	DRUM SUB ASSY
559B	LP20084-003A	UPPER DRUM ASSY
559D	LP40028-001A	COLLAR ASSY
559E	QAR0020-001	ROTOR ASSY
559F	QYSPSP3006Z	SCREW,X2
559G	PDM4439	CAP
559H	QAR0021-001	STATOR ASSY
559J	QYSPSP2606Z	SCREW,X2
559K	PDM4444-19-2	WASHER
559L	LP40323-001A	CONTACT
559M	LP30004-005A	COMPRESS.SPRING
559N	LP40174-001B	FPC PLATE
⚠ 560	LP10108-001A	BOTTOM CHASSIS
561	QYTDSF3010Z	SCREW,MAIN
562	DPSF3010Z	SCREW,X3 MAIN
563	LP10014-002A	BOTTOM COVER
564	QYTPST2608Z	SCREW,X3 DRUM
565	LP30312-001A	BRACKET(CHASSIS)
566	QYTDSF3010Z	SCREW,X2 BRACKET(CHASSIS)
567	QYTDSF4012Z	SCREW,X2 MECHA
568	QYTDSF3010Z	SCREW,X2 MECHA
569	QYTDST2606Z	SCREW,X2 DRUM SHIELD
570	LP30356-001A	DRUM SHIELD
⚠ 571	QMP51K0-170	POWER CORD
574	LP40253-001B	STOPPER
575	LP20324-002B	DOOR OPENER
WR1	QUQ212-0518CG	FFC WIRE,DRUM
WR2	WJT0005-001A	E-CARD WIRE,A/C HEAD

# ⚠ REF No.	PART No.	PART NAME, DESCRIPTION

5.3 MECHANISM ASSEMBLY <M4>


276
278
275
271
280
275
274
279
277
273
280
122
121
111
112
AA
272
211
104
110
AIC HEAD BOARD <12>
212
103
BB
114
113
AA
197
109
10
402
233
LODING MOTOR BOARD <55>
105
191
108
234
409
401
7
102
8
AA
232
4
BB
103
6A
196
195
171
176
451
118
401
AA
10
194
107
AA
2
409
5
AA
174
405
9
101
231
6B
281
119
AA
AA
3
106
402
15
AA
AA
282
1
16
13
406
402
14
17
17
251
253
252
12
11
AA
116
AA
53
AA
51
120
154
153
59
61
117
57
52
404
402
73
152
154
56
403
151
AA
64
153
115
54
175
453
65
58
AA
67
63
AA
55
AA
403
70
407
72
69
406
66
453
62
452
60
71
68
AA

Classifi-cation	Part No.	Symbol in drawing
Grease	KYODO-SH-P	AA
Oil	COSMO-HV56	BB

NOTE: The section marked in AA and BB indicate lubrication and greasing areas.

****

MECHANISM ASSEMBLY <M4>

# ⚠ REF No.	PART No.	PART NAME, DESCRIPTION
1	LP20228-003C	MAIN DECK ASSY
2	LP30232-002A	T.ARM BEARING
3	LP40097-001B	G.POLE CAP
4	LP40101-002A	POLE BASE ASSY(S)
5	LP40104-002A	POLE BASE ASSY(T)
6A	LP40096-002A	UV CATCHER(S)
6B	LP30409-001A	UV CATCHER2(T)
7	LP20234-001B	LID GUIDE
8	LP40108-001A	TENSION ARM ASSY
9	LP30003-001A	TENSION SPRING
10	LP40123-001A	REEL SHAFT,X2
11	LP40111-002A	MAIN BRAKE ASSY(TAKE-UP)
12	LP30003-007B	TENSION SPRING
13	LP40110-002C	MAIN BRAKE ASSY (SUPPLY)
14	LP30245-001B	REC SAFTY LEVER
15	LP30003-004A	TENSION SPRING
16	QAR0018-003	CAPSTAN MOTOR
17	PQ46302-1-3	ADJUST PIN,X2
51	LP30223-003A	LOADING ARM GEAR SHAFT
52	LP20233-003B	R.ENCODER GUIDE
53	LP30226-003A	CTL.PLATE GUIDE
54	LP40120-001A	WORM GEAR
55	LP30229-001B	CTL.CAM
56	LP30249-003A	T.UP LEVER
57	LP30003-006A	TENSION SPRING
58	LP40119-002A	T.UP HEAD
59	LP40113-001A	C.BRAKE ASSY
60	LP10080-002E	CTL.PLATE
61	LP30237-002A	CASSETTE GEAR
62	LP40107-002A	LINK LEVER ASSY
63	LP40122-001A	DIRECT GEAR
64	LP40224-001B	COMPRESSION SPRING
65	LP30017-002A	SPACER
66	LP40115-002C	CLUTCH UNIT
67	QSW0554-002	ROTARY ENCODER
68	LP30005-005A	BELT
69	LP30235-002A	CHANGE LEVER
70	LP40379-001A	CTL BRACKET(1)
71	LP30016-001A	SLIT WASHER
72	LP30017-009A	SPACER
73	LP40355-001A	TORSION SPRING,C.BRAKE
101	LP40114-002C	IDLER ARM ASSY
102	LP30236-002A	IDLER LEVER
103	LP30017-010A	SPACER,X2
104	LP20237-001B	REEL DISK (SUPPLY)
105	LP20238-001B	REEL DISK (TAKE-UP)
106	LP40112-001D	S.BRAKE(T)ASSY
107	LP40357-001B	TENSION SPRING
108	LP40109-002C	T.BRAKE ASSY
109	PQ46302-1-3	ADJUST PIN
110	LP40149-001B	P.LEVER ASSY
111	LP40148-001A	TORSION SPRING
112	LP40105-001A	P.R.ARM ASSY
113	LP40106-001B	GUIDE ARM ASSY
114	LP40134-001A	TENSION SPRING
115	LP30243-001B	DRIVE GEAR
116	LP30242-001A	RELAY GEAR
117	LP40214-001A	C.H.BRACKET
118	LP30244-001A	GUIDE RAIL
119	LP40118-001A	RAIL CAP
120	LP30339-001A	OPENER GUIDE
121	LP40382-001A	P.R.SHEET,P.R.ARM
122	LP30016-002A	SLIT WASHER,P.R.ARM
151	LP40103-002A	LOADING ARM GEAR(T)
152	LP30224-001A	LOADING ARM GEAR(S)
153	LP40100-001A	PIN,LODING ARM(S)
	LP40100-001A	PIN,LODING ARM(T)
154	LP40099-001A	TORSION ARM,L.ARM GEAR(S)
	LP40099-001A	TORSION ARM,L.ARM GEAR(T)
171	QAR0023-001	LOADING MOTOR
174	PQ43546-1-2	MOTOR PULLEY
175	LP30005-003A	BELT
176	LP30230-001B	MOTOR GUIDE
191	QAH0010-002	AC HEAD
194	LP30228-001A	HEAD BASE
195	LP30004-004A	COMPRESSION SPRING,X3
196	LP40236-001A	COMPRESSION SPRING
197	LP40213-002B	SPECIAL SCREW,X3 AC HEAD
211	LP20240-001A	DRIVE ARM
212	LP40137-001A	TORSION SPRING
231	NAH0001-001	FULL ERASE HEAD
232	LP40098-001B	GUIDE POLE(S)
233	LP30395-001B	TENSION STUD BASE
234	LP40367-001A	TENSION STUD
251	LP30239-002E	LIMIT GEAR(1)
252	LP30240-002C	LIMIT GEAR(2)
253	LP40136-001D	TORSION SPRING
271	LP10081-001B	SIDE HOLDER(L)
272	LP40403-001B	SIDE HOLDER(R) ASSY
273	LP30257-001C	CASSETTE HOLDER
274	LP20241-001C	TOP PLATE
275	LP30258-001B	SPRING PLATE,X2
276	LP30255-001F	LOCK LEVER(L)
277	LP30256-001C	LOCK LEVER(R)
278	LP40168-001A	TOR.SPRING(L)
279	LP40218-001B	TOR.SPRING(R)
280	LP30019-006C	PAD,X2 CASSTTE HOLDER
281	LP40275-001A	PLATE(S)
282	LP40276-001A	PLATE(T)
401	QYTDST2608Z	SCREW,FULL ERASE HEAD
	QYTDST2608Z	SCREW,X2 AC HEAD
402	QYTDST2606Z	SCREW,LOADING ARM GEAR SHAFT
	QYTDST2606Z	SCREW,ROTARY ENCORDER GUIDE
	QYTDST2606Z	SCREW,X2 LID GUIDE
	QYTDST2606Z	SCREW,X3 PLATE(S)
	QYTDST2606Z	SCREW,X3 PLATE(T)
403	QYSPSTG2606Z	SCREW,POLE BASE(S)
	QYSPSTG2606Z	SCREW,POLE BASE(T)
404	QYTPST2605Z	SCREW,CONTROL PLATE GUIDE
405	QYTPSP3003Z	SCREW,X2 LOADING MOTOR
406	QYTDSF2606M	SCREW,X3 CAPSTAN MOTOR
	QYTDSF2606M	SCREW,CTL BRACKET(1)
407	QYTPST2620Z	SCREW,ROTARY ENCODER
409	QYTPST2606Z	SCREW,X2 UV CATCHER
451	LP30016-001A	SLIT WASHER,IDLER ARM
452	PQM30017-24	SLIT WASHER,CONTROL CAM
	PQM30017-24	SLIT WASHER,LINK LEVER
453	PQM30017-47	SLIT WASHER,CLUTCH
	PQM30017-47	SLIT WASHER,C.H.BRACKET

# ⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
	R3031	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
	R3032	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
	R3033	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
	R3044	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
	R3045	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
	R3046	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
	R3047	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
	R3048	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
	R3049	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
	R3050	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
	R3052	NRSA02J-221X	MG RESISTOR	220Ω,1/10W
	R3053	QRE141J-102Y	RESISTOR	1kΩ,1/4W
	R3054	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
	R3055	QRE141J-102Y	RESISTOR	1kΩ,1/4W
	R3058	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
	R3061	QRE141J-102Y	RESISTOR	1kΩ,1/4W
	R3064	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
	R3065	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
	R3066	QRE141J-102Y	RESISTOR	1kΩ,1/4W
	R3067	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
	R3068	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
	R3069	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
	R3070	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
	R3071	NRSA02J-221X	MG RESISTOR	220Ω,1/10W
	R3072	NRSA02J-221X	MG RESISTOR	220Ω,1/10W
	R3073	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
	R3076	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
	R3079	QRE141J-102Y	RESISTOR	1kΩ,1/4W
	R3080	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
	R3081	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
	R3082	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
	R3201	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
	R3202	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
	R3203	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
	R3204	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
	R3205	QRE141J-562Y	RESISTOR	5.6kΩ,1/4W
	R3206	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
	R3207	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
	R3208	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
	R3209	QRE141J-181Y	RESISTOR	180Ω,1/4W
	R3210	NRSA02J-183X	MG RESISTOR	18kΩ,1/10W
	R3211	NRSA02J-183X	MG RESISTOR	18kΩ,1/10W
	R3212	NRSA02J-181X	MG RESISTOR	180Ω,1/10W
	R3213	NRSA02J-273X	MG RESISTOR	27kΩ,1/10W
	R3214	NRSA02J-181X	MG RESISTOR	180Ω,1/10W
	R3215	NRSA02J-273X	MG RESISTOR	27kΩ,1/10W
	R3216	QRE141J-474Y	RESISTOR	470kΩ,1/4W
	R3217	NRSA02J-334X	MG RESISTOR	330kΩ,1/10W
	R3218	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
	R3219	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
	R3220	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
	R3222	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
	R3223	NRSA02J-105X	MG RESISTOR	1MΩ,1/10W
	R3224	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
	R3226	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
	R3227	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
	R3228	NRSA02J-104X	MG RESISTOR	100kΩ,1/10W
	R3232	NRSA02J-104X	MG RESISTOR	100kΩ,1/10W
	R3233	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
	R3234	QRE141J-472Y	RESISTOR	4.7kΩ,1/4W
	R3238	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
	R3301	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
	R3313	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
	R3314	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
	R3326	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
	R3328	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
	R3330	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
	R3333	QRE141J-103Y	RESISTOR	10kΩ,1/4W
	R3349	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
	R3352	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
	R3353	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
	R3354	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
	R3355	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
	R3501	NRSA02J-105X	MG RESISTOR	1MΩ,1/10W
	R4001	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
	R4002	NRSA02J-223X	MG RESISTOR	22kΩ,1/10W
	R4004	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
	R4005	NRSA02J-104X	MG RESISTOR	100kΩ,1/10W
	R4006	NRSA02J-392X	MG RESISTOR	3.9kΩ,1/10W
	R4007	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
	R4009	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
	R4010	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
	R4011	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
	R4012	NRSA02J-153X	MG RESISTOR	15kΩ,1/10W
	R4013	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
	R4018	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
	R4019	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
	R4020	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
	R4021	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
	R4022	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
	R4025	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
	R4026	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
	R4027	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
	R5101	QRE141J-334Y	RESISTOR	330kΩ,1/4W
	R5102	QRE141J-334Y	RESISTOR	330kΩ,1/4W
	R5103	QRE141J-683Y	RESISTOR	68kΩ,1/4W
	R5104	QRG029J-154G	OMF RESISTOR	150kΩ,2W
	R5106	QRT01DJ-R39X	MF RESISTOR	0.39Ω,1W
	R5107	QRE121J-331Y	RESISTOR	330Ω,1/2W
	R5108	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
	R5109	NRSA02J-681X	MG RESISTOR	680Ω,1/10W
	R5110	NRSA02J-224X	MG RESISTOR	220kΩ,1/10W
	R5111	NRSA02J-821X	MG RESISTOR	820Ω,1/10W
	R5301	NRSA02J-5R6X	MG RESISTOR	5.6Ω,1/10W
	R5302	NRSA02J-5R6X	MG RESISTOR	5.6Ω,1/10W
	R5303	NRSA02J-5R6X	MG RESISTOR	5.6Ω,1/10W
	R5304	QRE141J-8R2Y	RESISTOR	8.2Ω,1/4W
	R5306	NRSA02J-333X	MG RESISTOR	33kΩ,1/10W
	R5307	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
	R5312	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
	R5313	NRSA02J-122X	MG RESISTOR	1.2kΩ,1/10W
⚠	R5314	QRZ9005-221X	FUSI RESISTOR	220Ω,1/4W
	R5319	QRE141J-511Y	RESISTOR	510Ω,1/4W
	R5320	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
	R5350	NRSA02J-221X	MG RESISTOR	220Ω,1/10W
	R5351	NRSA02J-473X	MG RESISTOR	47kΩ,1/10W
	R6001	NRSA02J-271X	MG RESISTOR	270Ω,1/10W
	R6002	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
	R6020	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
	R6021	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
	R6022	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
	R6023	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
	R6032	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
	R6051	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
	R6052	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
	R6053	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
	R6054	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
	R6084	NRSA02J-682X	MG RESISTOR	6.8kΩ,1/10W
	R6085	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
	R7001	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
	R7002	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
	R7003	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
	R7004	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
	R7005	QRE141J-103Y	RESISTOR	10kΩ,1/4W
	R7006	QRE141J-103Y	RESISTOR	10kΩ,1/4W
	R7007	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
	R7008	QRE141J-103Y	RESISTOR	10kΩ,1/4W
	R7013	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
	R7014	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
	R7015	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
	R7016	NRSA02J-331X	MG RESISTOR	330Ω,1/10W
	R7020	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
	R7021	NRSA02J-122X	MG RESISTOR	1.2kΩ,1/10W
	R7022	NRSA02J-182X	MG RESISTOR	1.8kΩ,1/10W
	R7023	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
	R7024	NRSA02J-272X	MG RESISTOR	2.7kΩ,1/10W
	R7025	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
	R7026	NRSA02J-682X	MG RESISTOR	6.8kΩ,1/10W
	R7027	NRSA02J-153X	MG RESISTOR	15kΩ,1/10W
	R7028	NRSA02J-393X	MG RESISTOR	39kΩ,1/10W
	R7030	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
	R7031	NRSA02J-122X	MG RESISTOR	1.2kΩ,1/10W
	R7032	NRSA02J-182X	MG RESISTOR	1.8kΩ,1/10W
	R7033	QRE141J-222Y	RESISTOR	2.2kΩ,1/4W
	R7034	NRSA02J-272X	MG RESISTOR	2.7kΩ,1/10W
	R7035	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
	R7036	NRSA02J-682X	MG RESISTOR	6.8kΩ,1/10W
	R7037	NRSA02J-153X	MG RESISTOR	15kΩ,1/10W
	R7038	NRSA02J-393X	MG RESISTOR	39kΩ,1/10W
	R7052	NRSA02J-393X	MG RESISTOR,J255ES	39kΩ,1/10W
	R7054	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
	R7102	QRE141J-750Y	RESISTOR	75Ω,1/4W
	R7103	NRSA02J-750X	MG RESISTOR	75Ω,1/10W
	R7105	NRSA02J-682X	MG RESISTOR	6.8kΩ,1/10W
	R7106	NRSA02J-682X	MG RESISTOR	6.8kΩ,1/10W
	R7107	NRSA02J-682X	MG RESISTOR	6.8kΩ,1/10W
	R7108	NRSA02J-682X	MG RESISTOR	6.8kΩ,1/10W
	R7121	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
	R7122	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
	R7123	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
	R7126	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
	R7127	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
	R7128	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
	R7129	QRE141J-222Y	RESISTOR	2.2kΩ,1/4W
	R7131	NRSA02J-333X	MG RESISTOR	33kΩ,1/10W
	R7132	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
	R7133	NRSA02J-224X	MG RESISTOR	220kΩ,1/10W
	R7134	NRSA02J-473X	MG RESISTOR	47kΩ,1/10W
	R7135	NRSA02J-473X	MG RESISTOR	47kΩ,1/10W
	R7139	NRSA02J-750X	MG RESISTOR	75Ω,1/10W
	C1	QEKC1CM-106	E CAPACITOR	10μF,16V
	C7	QEKC0JM-476	E CAPACITOR	47μF,6.3V
	C8	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
	C9	NCF21CZ-105X	CAPACITOR	1μF,16V
	C10	NCF21CZ-105X	CAPACITOR	1μF,16V
	C11	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
	C12	NCB21EK-104X	CAPACITOR	0.1μF,25V
	C13	QEKJ1HM-335	E CAPACITOR	3.3μF,50V
	C14	NCB21EK-333X	CAPACITOR	0.033μF,25V
	C16	NCF21CZ-105X	CAPACITOR	1μF,16V
	C20	QEKJ1HM-225	E CAPACITOR	2.2μF,50V
	C21	NCB21EK-104X	CAPACITOR	0.1μF,25V
	C23	NCB21EK-223X	CAPACITOR	0.022μF,25V
	C24	NCB21CK-474X	CAPACITOR	0.47μF,16V
	C25	NCB21CK-224X	CAPACITOR	0.22μF,16V
	C27	NCF21HZ-103X	CAPACITOR	0.01μF,50V
	C29	QEKJ1EM-475	E CAPACITOR	4.7μF,25V
	C31	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
	C32	NCB21HK-103X	CAPACITOR	0.01μF,50V
	C34	NCB21EK-104X	CAPACITOR	0.1μF,25V
	C35	NCF21HZ-103X	CAPACITOR	0.01μF,50V
	C37	QEKC0JM-107	E CAPACITOR	100μF,6.3V
	C41	NCB21EK-104X	CAPACITOR	0.1μF,25V
	C42	QDYB1CM-103Y	CAPACITOR	0.01μF,16V
	C43	NCF21HZ-103X	CAPACITOR	0.01μF,50V
	C45	NCB21EK-104X	CAPACITOR	0.1μF,25V
	C47	NCB21HK-103X	CAPACITOR	0.01μF,50V
	C48	QEKJ0JM-476	E CAPACITOR	47μF,6.3V
	C49	NDC21HJ-331X	CAPACITOR	330pF,50V
	C51	QEQF1HM-225	NP E CAPACITOR	2.2μF,50V
	C54	QEKJ1HM-225	E CAPACITOR	2.2μF,50V
	C55	QEKC1CM-106	E CAPACITOR	10μF,16V
	C56	QEKJ1HM-335	E CAPACITOR	3.3μF,50V
	C57	NCB21EK-104X	CAPACITOR	0.1μF,25V
	C58	NCB21EK-104X	CAPACITOR	0.1μF,25V
	C59	NCB21EK-104X	CAPACITOR	0.1μF,25V
	C60	NCB21CK-474X	CAPACITOR	0.47μF,16V
	C61	NDC21HJ-330X	CAPACITOR	33pF,50V
	C62	NCB21EK-104X	CAPACITOR	0.1μF,25V
	C63	NDC21HJ-151X	CAPACITOR	150pF,50V
	C64	QEKJ0JM-476	E CAPACITOR	47μF,6.3V
	C65	NCB21EK-393X	CAPACITOR	0.039μF,25V
	C83	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
	C84	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
	C101	NDC21HJ-100X	CAPACITOR	10pF,50V
	C107	NDC21HJ-5R0X	CAPACITOR	5pF,50V
	C108	NCB21EK-563X	CAPACITOR	0.056μF,25V
	C133	QCC11EK-223	CAPACITOR	0.022μF,25V
	C134	NCB21EK-104X	CAPACITOR	0.1μF,25V
	C135	NCB21EK-104X	CAPACITOR	0.1μF,25V
	C136	NCB11EK-104X	CAPACITOR	0.1μF,25V
	C152	NCF21HZ-103X	CAPACITOR	0.01μF,50V
	C201	NDC21HJ-100X	CAPACITOR	10pF,50V
	C207	NCB21CK-224X	CAPACITOR	0.22μF,16V
	C209	NCB21CK-224X	CAPACITOR	0.22μF,16V
	C211	QEKJ1HM-105	E CAPACITOR	1μF,50V
	C213	QEKJ1HM-105	E CAPACITOR	1μF,50V
	C215	QERF0JM-107	E CAPACITOR	100μF,6.3V
	C251	NCB21EK-104X	CAPACITOR	0.1μF,25V
	C252	QEKJ1EM-475	E CAPACITOR	4.7μF,25V
	C253	NCB21CK-224X	CAPACITOR	0.22μF,16V
	C254	QEKJ0JM-227	E CAPACITOR	220μF,6.3V
	C255	NCB21EK-333X	CAPACITOR	0.033μF,25V
	C256	QEKJ1EM-475	E CAPACITOR	4.7μF,25V

5.4 ELECTRICAL PARTS LIST

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MAIN BOARD ASSEMBLY <03>

# ⚠ REF No.	PART No.	PART NAME, DESCRIPTION	
PW1	LPA10008-03B1	MAIN BOARD ASSY,J255EK	
	LPA10008-05B1	MAIN BOARD ASSY,J255ES	
IC1	HA118211F	IC	
IC201	LC74799-9608	IC	
IC3001	M37777MAA1D1GP	IC	
	or M37777EAA1D1GP	IC	
IC3002	TA7291S	IC	
IC3003	S-80727AN-Z	IC	
IC3004	ST24C08FB6	IC	
	or AT24C08-10PC	IC	
	or 24LC08B/P	IC	
IC3301	M37471M8-705FP	IC	
	or M37471E8-705FP	IC	
IC5301	LA5613	IC	
IC6080	BA15218F-XE	IC	
IC7001	M35500BFP	IC	
	or M35500BGP	IC	
	or M35500AGP	IC	
IC7002	GP1U291Q	IR DETECT UNIT	
	or PIC-21143LJ	IR DETECT UNIT	
	or PNA4652M00YC	IR DETECT UNIT	
IC7121	BH7634AS	IC	
IC7122	BA15218F-XE	IC	
Q1	2SD1819A/QRS/-X	TRANSISTOR	
	or 2SC4081/QRS/-X	TRANSISTOR	
	or 2PC4081/R/-X	TRANSISTOR	
Q253	2SD1819A/QRS/-X	TRANSISTOR	
	or 2PC4081/R/-X	TRANSISTOR	
	or 2SC4081/QRS/-X	TRANSISTOR	
Q254	2SB1218A/QR/-X	TRANSISTOR	
	or 2SA1576A/QR/-X	TRANSISTOR	
	or 2PA1576/R/-X	TRANSISTOR	
Q2001	2SC4081/QRS/-X	TRANSISTOR	
	or 2PC4081/R/-X	TRANSISTOR	
	or 2SD1819A/QRS/-X	TRANSISTOR	
Q2002	2SC4081/QRS/-X	TRANSISTOR	
	or 2SD1819A/QRS/-X	TRANSISTOR	
	or 2PC4081/R/-X	TRANSISTOR	
Q2003	DTA144WU	TRANSISTOR	
	or RN2309	TRANSISTOR	
	or UN511E	TRANSISTOR	
Q2051	2SC4081/QRS/-X	TRANSISTOR	
	or 2PC4081/R/-X	TRANSISTOR	
	or 2SD1819A/QRS/-X	TRANSISTOR	
Q2052	2SA1576A/QR/-X	TRANSISTOR	
	or 2SB1218A/QR/-X	TRANSISTOR	
	or 2PA1576/R/-X	TRANSISTOR	
Q2053	DTC144WU	TRANSISTOR	
	or RN1309	TRANSISTOR	
	or UN521E	TRANSISTOR	
Q2054	2SA1576A/QR/-X	TRANSISTOR	
	or 2SB1218A/QR/-X	TRANSISTOR	
	or 2PA1576/R/-X	TRANSISTOR	
Q2055	DTC144WU	TRANSISTOR	
	or RN1309	TRANSISTOR	
	or UN521E	TRANSISTOR	
Q3001	PTZ-NV16	PHOTO TRANSISTOR	
Q3002	PTZ-NV16	PHOTO TRANSISTOR	
Q3003	2SD1819A/QRS/-X	TRANSISTOR	
	or 2SC4081/QRS/-X	TRANSISTOR	
	or 2PC4081/R/-X	TRANSISTOR	
Q3004	2SD1819A/QRS/-X	TRANSISTOR	
	or 2PC4081/R/-X	TRANSISTOR	
	or 2SC4081/QRS/-X	TRANSISTOR	
Q4001	UN5211	TRANSISTOR	
	or RN1302	TRANSISTOR	
	or DTC114EU	TRANSISTOR	
Q4002	2SD1819A/QRS/-X	TRANSISTOR	
	or 2PC4081/R/-X	TRANSISTOR	
	or 2SC4081/QRS/-X	TRANSISTOR	
Q5101	2SK2632-CB14	FE TRANSISTOR	
	or 2SK2666F04	FE TRANSISTOR	
	or 2SK2129-LT	POWER MOS FET	
Q5102	2SD2144S/UV/-T	TRANSISTOR	
Q5306	2SD2144S/UVW/-T	TRANSISTOR	
Q5322	2SD1450/ST/-T	TRANSISTOR	
	or 2SD1302/ST/-T	TRANSISTOR	
Q6001	2SC3068	TRANSISTOR	
Q6031	DTC114EU	TRANSISTOR	
	or RN1302	TRANSISTOR	
	or UN5211	TRANSISTOR	
Q6032	DTC114EU	TRANSISTOR	
	or RN1302	TRANSISTOR	
	or UN5211	TRANSISTOR	
Q7121	2SB1218A/QR/-X	TRANSISTOR	
	or 2SA1576A/QR/-X	TRANSISTOR	
	or 2PA1576/R/-X	TRANSISTOR	
Q7122	UN521E	TRANSISTOR	
	or DTC144WU	TRANSISTOR	
	or RN1309	TRANSISTOR	
Q7123	UN511E	TRANSISTOR	
	or RN2309	TRANSISTOR	
	or DTA144WU	TRANSISTOR	
Q7124	2SD1819A/QRS/-X	TRANSISTOR	
	or 2PC4081/R/-X	TRANSISTOR	
	or 2SC4081/QRS/-X	TRANSISTOR	
D206	1N4148M	DIODE	
	or 1SS133	DIODE	
D2001	1N4148M	DIODE	
	or 1SS133	DIODE	
D3001	LNB2301L01VI	LE DIODE	
D3002	1N4148M	DIODE	
	or 1SS133	DIODE	
D3004	11ES2	DIODE	
D3005	11ES2	DIODE	
D3006	RD39ES/B3/-T2	ZENER DIODE	
	or UZ39BSC	ZENER DIODE	
	or MTZJ39C	ZENER DIODE	
D3009	1N4148M	DIODE	
	or 1SS133	DIODE	
D3010	1N4148M	DIODE	
	or 1SS133	DIODE	
D4003	1N4148M	DIODE	
	or 1SS133	DIODE	
D4004	1N4148M	DIODE	
	or 1SS133	DIODE	
D5001	S1WB(A)60F4102	BRIDGE DIODE	
	or S1WB(A)60F4062X	BRIDGE DIODE	
	or S1WB(A)60F4072X	BRIDGE DIODE	
D5101	AU01	FR DIODE	
	or 1SR153-400-T2	FR DIODE	
	or 10ELS4	FR DIODE	
	or ERA18-04-T2	FR DIODE	
D5102	AU01	FR DIODE	
	or ERA18-04-T2	FR DIODE	
	or 10ELS4	FR DIODE	
	or 1SR153-400-T2	FR DIODE	
D5103	1N4148M	DIODE	
	or 1SS133	DIODE	
D5201	ERA18-02-T2	FR DIODE	
	or 1SR153-200-T2	FR DIODE	
D5203	AU01Z	FR DIODE	
	or 1SR153-200-T2	FR DIODE	
	or 10ELS2	FR DIODE	
	or ERA18-02-T2	FR DIODE	
D5204	AU01Z	FR DIODE	
	or 1SR153-200-T2	FR DIODE	
	or 10ELS2	FR DIODE	
	or ERA18-02-T2	FR DIODE	
D5205	AU01Z	FR DIODE	
	or ERA18-02-T2	FR DIODE	
	or 1SR153-200-T2	FR DIODE	
	or 10ELS2	FR DIODE	
D5210	AU01Z	FR DIODE	
	or ERA18-02-T2	FR DIODE	
	or 1SR153-200-T2	FR DIODE	
	or 10ELS2	FR DIODE	
D5211	AU01Z	FR DIODE	
	or ERA18-02-T2	FR DIODE	
	or 1SR153-200-T2	FR DIODE	
	or 10ELS2	FR DIODE	
D5212	21DQ04	BARRIER DIODE	
	or RK14LF-B2	BARRIER DIODE	
D5301	UZ15BSA	ZENER DIODE	
	or MTZJ15A	ZENER DIODE	
	or RD15ES/B1/-T2	ZENER DIODE	
D5304	1N4148M	DIODE	
	or 1SS133	DIODE	
D5305	UZ30BSA	ZENER DIODE	
	or RD30ES/B1/-T2	ZENER DIODE	
	or MTZJ30A	ZENER DIODE	
D5306	UZ6.8BSA	ZENER DIODE	
	or MTZJ6.8A	ZENER DIODE	
	or RD6.8ES/B1/-T2	ZENER DIODE	
D6001	MTZJ10B	ZENER DIODE	
D6002	HZ30-2L-T2	ZENER DIODE	
D7002	RD9.1ES/B2/-T2	ZENER DIODE	
	or UZ9.1BSB	ZENER DIODE	
	or MTZJ9.1B	ZENER DIODE	
D7008	1N4148M	DIODE	
	or 1SS133	DIODE	
D7154	1N4148M	DIODE	
	or 1SS133	DIODE	
D7155	1N4148M	DIODE	
	or 1SS133	DIODE	
R1	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
R2	NRSA02J-391X	MG RESISTOR	390Ω,1/10W
R3	NRSA02J-273X	MG RESISTOR	27kΩ,1/10W
R4	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
R5	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
R6	NRSA02J-182X	MG RESISTOR	1.8kΩ,1/10W
R15	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
R19	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
R21	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
R23	NRSA02J-682X	MG RESISTOR	6.8kΩ,1/10W
R24	NRSA02J-682X	MG RESISTOR	6.8kΩ,1/10W
R25	NRSA02J-152X	MG RESISTOR	1.5kΩ,1/10W
R136	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
R204	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
R208	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
R211	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
R252	NRSA02J-123X	MG RESISTOR	12kΩ,1/10W
R253	NRSA02J-182X	MG RESISTOR	1.8kΩ,1/10W
R254	NRSA02J-562X	MG RESISTOR	5.6kΩ,1/10W
R255	NRSA02J-182X	MG RESISTOR	1.8kΩ,1/10W
R258	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
R259	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
R260	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
R261	NRSA02J-681X	MG RESISTOR	680Ω,1/10W
R2001	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
R2002	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
R2003	NRSA02J-682X	MG RESISTOR	6.8kΩ,1/10W
R2004	NRSA02J-224X	MG RESISTOR	220kΩ,1/10W
R2005	NRSA02J-121X	MG RESISTOR	120Ω,1/10W
R2006	NRSA02J-273X	MG RESISTOR	27kΩ,1/10W
R2007	QRE141J-223Y	RESISTOR	22kΩ,1/4W
R2013	NRSA02J-393X	MG RESISTOR	39kΩ,1/10W
R2014	NRSA02J-183X	MG RESISTOR	18kΩ,1/10W
R2015	QRE141J-472Y	RESISTOR	4.7kΩ,1/4W
R2016	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
R2018	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
R2019	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
R2053	NRSA02J-822X	MG RESISTOR	8.2kΩ,1/10W
R2054	NRSA02J-123X	MG RESISTOR	12kΩ,1/10W
R2055	NRSA02J-3R3X	MG RESISTOR	3.3Ω,1/10W
R2056	QRE141J-820Y	RESISTOR	82Ω,1/4W
R2057	NRSA02J-473X	MG RESISTOR	47kΩ,1/10W
R2058	NRSA02J-183X	MG RESISTOR	18kΩ,1/10W
R2059	NRSA02J-473X	MG RESISTOR	47kΩ,1/10W
R2060	NRSA02J-183X	MG RESISTOR	18kΩ,1/10W
R3001	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
R3002	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
R3004	QRE141J-102Y	RESISTOR	1kΩ,1/4W
R3005	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
R3006	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
R3007	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
R3010	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
R3011	NRSA02J-104X	MG RESISTOR	100kΩ,1/10W
R3013	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
R3014	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
R3015	NRSA02J-221X	MG RESISTOR	220Ω,1/10W
R3016	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
R3017	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
R3021	NRSA02J-104X	MG RESISTOR	100kΩ,1/10W
R3022	NRSA02J-104X	MG RESISTOR	100kΩ,1/10W
R3023	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
R3026	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
R3027	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
R3029	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
R3030	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
		C258	NDC21HJ-560X	CAPACITOR	56pF,50V
		C260	QERF0JM-107	E CAPACITOR	100μF,6.3V
		C289	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C2002	QEKJ1CM-476	E CAPACITOR	47μF,16V
		C2003	NCB21HK-123X	CAPACITOR	0.012μF,50V
		C2004	QEKJ1CM-226	E CAPACITOR	22μF,16V
		C2005	NCB21HK-102X	CAPACITOR	0.001μF,50V
		C2006	NCB21HK-331X	CAPACITOR	330pF,50V
		C2007	QEKJ1CM-106	E CAPACITOR	10μF,16V
		C2008	NCB21HK-152X	CAPACITOR	0.0015μF,50V
		C2009	QEKJ1EM-475	E CAPACITOR	4.7μF,25V
		C2010	QEKJ1EM-475	E CAPACITOR	4.7μF,25V
		C2013	NCB21EK-333X	CAPACITOR	0.033μF,25V
		C2015	QEKJ1CM-226	E CAPACITOR	22μF,16V
		C2016	QEKJ1EM-475	E CAPACITOR	4.7μF,25V
		C2051	NCB21HK-331X	CAPACITOR	330pF,50V
		C2052	QFN31HJ-823	F CAPACITOR	0.082μF,50V
		C2053	NCB21HK-472X	CAPACITOR	0.0047μF,50V
		C2054	NCB21CK-223X	CAPACITOR	0.022μF,16V
		C2055	QEKJ1CM-106	E CAPACITOR	10μF,16V
		C3002	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C3003	QEKJ1HM-106Z	E CAPACITOR	10μF,50V
		C3004	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C3005	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C3013	QEKJ1CM-106	E CAPACITOR	10μF,16V
		C3015	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C3016	NDC21HJ-180X	CAPACITOR	18pF,50V
		C3017	NDC21HJ-100X	CAPACITOR	10pF,50V
		C3019	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		C3021	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C3023	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C3024	QEKJ0JM-476	E CAPACITOR	47μF,6.3V
		C3025	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C3026	QERF1CM-106	E CAPACITOR	10μF,16V
		C3027	QETL0JM-338	E CAPACITOR	3300μF,6.3V
		C3029	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C3035	NDC21HJ-101X	CAPACITOR	100pF,50V
		C3041	NDC21HJ-470X	CAPACITOR	47pF,50V
		C3042	NDC21HJ-470X	CAPACITOR	47pF,50V
		C3043	NCB21HK-473X	CAPACITOR	0.047μF,50V
		C3044	QERF0JM-107	E CAPACITOR	100μF,6.3V
		C3045	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C3303	NCB21HK-102X	CAPACITOR	0.001μF,50V
		C3304	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C3305	QEKJ1HM-335	E CAPACITOR	3.3μF,50V
		C3313	NDC21HJ-330X	CAPACITOR	33pF,50V
		C3314	QAT3725-300Z	TRIM CAPACITOR,TIMER CLOCK	
		C4001	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C4002	QEKJ1HM-224	E CAPACITOR	0.22μF,50V
		C4004	QEKJ0JM-226	E CAPACITOR	22μF,6.3V
		C4007	NCB21HK-273X	CAPACITOR	0.027μF,50V
		C4008	QEKJ1CM-106	E CAPACITOR	10μF,16V
		C4009	NCB21HK-102X	CAPACITOR	0.001μF,50V
		C4011	NCB21CK-224X	CAPACITOR	0.22μF,16V
		C4012	NCB21EK-563X	CAPACITOR	0.056μF,25V
		C4013	NCB21HK-102X	CAPACITOR	0.001μF,50V
		C4014	NDC21HJ-101X	CAPACITOR	100pF,50V
		C4015	NDC21HJ-101X	CAPACITOR	100pF,50V
		C4016	QEKJ0JM-476	E CAPACITOR	47μF,6.3V
		C4017	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C4019	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C4021	NCB21EK-104X	CAPACITOR	0.1μF,25V
	⚠	C5001	QFZ9051-683	F CAPACITOR	0.068μF,250V
	⚠	C5002	QFZ9051-333	F CAPACITOR	0.033μF,250V
	⚠	C5005	QCZ9071-222	CAPACITOR	0.0022μF,250V
		C5006	QEZ0374-686	E CAPACITOR	68μF,400V
		C5101	QCZ0212-472	CAPACITOR	0.0047μF,1kV
		C5102	QCZ0302-330Z	CAPACITOR	33pF,1kV
		C5104	QETC1HM-105	E CAPACITOR	1μF,50V
		C5105	QFN31HJ-183	F CAPACITOR	0.018μF,50V
		C5106	QCBB1HJ-271	CAPACITOR	270pF,50V
		C5107	QFV11HJ-104	F CAPACITOR	0.1μF,50V
		C5201	QEMU0JM-227	E CAPACITOR	220μF,6.3V
		C5202	QEMT1CM-827	E CAPACITOR	820μF,16V
		C5203	QETC1CM-227	E CAPACITOR	220μF,16V
		C5204	QEMT1AM-687	E CAPACITOR	680μF,10V
		C5205	QETC1AM-227	E CAPACITOR	220μF,10V
		C5207	QETC1JM-106	E CAPACITOR	10μF,63V
		C5208	QETC1HM-106	E CAPACITOR	10μF,50V
		C5301	QEMU0JM-227	E CAPACITOR	220μF,6.3V
		C5302	QETC1HM-106	E CAPACITOR	10μF,50V
		C5303	QETC1CM-107	E CAPACITOR	100μF,16V
		C5304	QFLC1HJ-183Z	F CAPACITOR	0.018μF,50V
		C5306	NCF21HZ-103X	CAPACITOR	0.01μF,50V
		C5309	QETC1AM-107	E CAPACITOR	100μF,10V
		C5310	QETC1CM-226	E CAPACITOR	22μF,16V
		C5316	QEKC1CM-476	E CAPACITOR	47μF,16V
		C5317	QETC1CM-107	E CAPACITOR	100μF,16V
		C6001	QETC1CM-476	E CAPACITOR	47μF,16V
		C6003	QETC1CM-336	E CAPACITOR	33μF,16V
		C6004	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C6005	QETC1HM-106	E CAPACITOR	10μF,50V
		C6006	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C6008	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C6012	QETC1HM-106	E CAPACITOR	10μF,50V
		C6014	NCB21HK-473X	CAPACITOR	0.047μF,50V
		C6024	NCB21HK-471X	CAPACITOR	470pF,50V
		C6027	NDC21HJ-101X	CAPACITOR	100pF,50V
		C6033	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		C6037	QETC1HM-106	E CAPACITOR	10μF,50V
		C6051	NDC21HJ-101X	CAPACITOR	100pF,50V
		C6052	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C7001	NCB21HK-102X	CAPACITOR	0.001μF,50V
		C7002	QEKJ1HM-106	E CAPACITOR	10μF,50V
		C7007	QEKJ0JM-476	E CAPACITOR	47μF,6.3V
		C7008	NCB21EK-223X	CAPACITOR	0.022μF,25V
		C7009	NDC21HJ-220X	CAPACITOR	22pF,50V
		C7010	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C7011	QEKJ0JM-227	E CAPACITOR	220μF,6.3V
		C7101	NCB21HK-331X	CAPACITOR	330pF,50V
		C7102	NCB21HK-331X	CAPACITOR	330pF,50V
		C7103	NCB21HK-471X	CAPACITOR	470pF,50V
		C7104	NCB21HK-331X	CAPACITOR	330pF,50V
		C7105	NCB21HK-331X	CAPACITOR	330pF,50V
		C7109	NDC21HJ-331X	CAPACITOR	330pF,50V
		C7110	NDC21HJ-331X	CAPACITOR	330pF,50V
		C7111	NDC21HJ-331X	CAPACITOR	330pF,50V
		C7122	QETC1CM-476	E CAPACITOR	47μF,16V
		C7123	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C7124	NCB21EK-223X	CAPACITOR	0.022μF,25V
		C7125	QDVB1EZ-223Y	CAPACITOR	0.022μF,25V
		C7126	QDVB1EZ-223Y	CAPACITOR	0.022μF,25V
		C7127	NCB21EK-223X	CAPACITOR	0.022μF,25V
		C7128	QEKJ1CM-106	E CAPACITOR	10μF,16V
		C7129	QEKJ1CM-106	E CAPACITOR	10μF,16V
		C7130	QEKJ1CM-106	E CAPACITOR	10μF,16V
		C7131	QEKJ1CM-476	E CAPACITOR	47μF,16V
		C7132	QETC1CM-476	E CAPACITOR	47μF,16V
		C7133	QEKJ1CM-476	E CAPACITOR	47μF,16V
		C7134	QEKJ1CM-106	E CAPACITOR	10μF,16V
		C7135	NDC21HJ-330X	CAPACITOR	33pF,50V
		C7136	NDC21HJ-330X	CAPACITOR	33pF,50V
		C7141	NCB21HK-102X	CAPACITOR	0.001μF,50V
		C7142	QDVB1EZ-223Y	CAPACITOR	0.022μF,25V
		C7144	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C7145	NDC21HJ-101X	CAPACITOR	100pF,50V
		L1	QQL29BJ-100Z	COIL	10μH
		L4	QQL29BJ-100Z	COIL	10μH
		L7	QQL29BK-R22Z	COIL	0.22μH
		L8	QQL29BJ-101Z	COIL	100μH
		L9	QQL29BJ-100Z	COIL	10μH
		L18	PELN1203	COIL	12μH
		L101	QQL29BJ-221Z	COIL	220μH
		L202	QQL29BJ-330Z	COIL	33μH
		L204	QQL29BK-1R0Z	COIL	1μH
		L251	QQL29BJ-100Z	COIL	10μH
		L252	QQL29BJ-220Z	COIL	22μH
		L5201	PELN1184	COIL	33μF
		L5202	PELN1184	COIL	33μF
		L5301	QQL29BJ-151Z	COIL	150μH
		L6002	QQL29BK-1R0Z	COIL	1μH
		L7101	QRE141J-101Y	RESISTOR	100Ω,1/4W
		L7102	QRE141J-101Y	RESISTOR	100Ω,1/4W
		L7103	QRE141J-101Y	RESISTOR	100Ω,1/4W
		L7105	QRE141J-101Y	RESISTOR	100Ω,1/4W
		L7106	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		L7122	QQL231J-1R0Y	COIL	1μH
		L7123	QQL231J-1R0Y	COIL	1μH
		CF3301	PU60440-2	RESONATOR	
		X1	QAX0436-001	CRYSTAL RESONATOR	
		X3001	QAX0320-001	CRYSTAL RESONATOR	
		X3302	QAX0445-001	CRYSTAL RESONATOR	
		S3001	QSW0602-001	PUSH SWITCH,REC SAFETY	
		S7001	QSW0619-002Z	TACT SWITCH,POWER	
		S7002	QSW0619-002Z	TACT SWITCH,SP/LP	
		S7004	QSW0619-002Z	TACT SWITCH,CH-	
		S7006	QSW0619-002Z	TACT SWITCH,CH+	
		S7008	QSW0619-002Z	TACT SWITCH,DISPLAY	
		S7010	QSW0619-002Z	TACT SWITCH,REC	
		S7011	QSW0619-002Z	TACT SWITCH,REW	
		S7012	QSW0619-002Z	TACT SWITCH,STOP/EJECT	
		S7013	QSW0619-002Z	TACT SWITCH,PLAY	
		S7014	QSW0619-002Z	TACT SWITCH,PAUSE	
		S7015	QSW0619-002Z	TACT SWITCH,FF	
		S7016	QSW0619-002Z	TACT SWITCH,STBOX	
		K5101	QQR0678-001Z	FERRITE BEAD	
	⚠	PC5101	PC123F2	PH COUPLER	
		PS3001	GP3S123	PHOTOTRANSISTOR	
		PS3002	GP3S123	PHOTOTRANSISTOR	
		T2051	PELN0832	OSC TRANSFORMER	
	⚠	T5001	QQS0017-001	SW TRANSF	
	⚠	F5001	QMF51E2-1R6J1	FUSE	T1.6A
		FC5001	QNG0006-001Z	FUSE CLIP,F5001	
		FC5002	QNG0006-001Z	FUSE CLIP,F5001	
		J7101	PEMC1104	RGB21PIN SOCKET	
		J7102	PEMC1104	RGB21PIN SOCKET	
	⚠	LF5001	PELN1204-01-01	LINE FILTER	
	⚠	LF5002	QQR0608-001	LINE FILTER	
		OT1	LP40226-001A	PC SUPPORT,X2	
		OT2	QYTDST3006Z	SCREW,Q5101	
	⚠	HS1	PQ45788-1-2	HEAT SINK,Q5101	
		SD1	LP30313-001A	SHIELD CASE.PRE/REC	
		DI7001	QLF0031-001	FL TUBE	
		HD1	PQ35479-1-4	HOLDER(FDP),DI7001	
		OT3005	QGZ2501L1-02	SHORT SOCKET,CN3005	
		TU6001	QAU0073-001	TUNER,J255EK	
			QAU0078-001	TUNER,J255ES	
		CN1	QGF1018C4-04	FPC CONNECTOR,(5-8)U.DRUM	
		CN2001	QGF1207C1-07	FPC CONNECTOR,(1-7)A/C HEAD	
		CN2002	QGB2532J1-02	CONNECTOR,(1-2)FE HEAD	
		CN3001	QGB2015M1-08	CONNECTOR,(1-8)CAP MDA	
		CN3002	QGF1207C1-05	FPC CONNECTOR,(1-5)DRUM MDA	
		CN3003	QGB2532J1-02	CONNECTOR,(1-2)L.MOTOR	
		CN3004	QGB2534J2-04	CONNECTOR,(1-4)R.ENCODER	
		CN3005	QGG2504M1-02	HEADER PIN,(1-2)	
		CN5001	QGA7901C1-02	CONNECTOR,(1-2)AC IN	
		CN7002	QGB2530K1-03	CONNECTOR,(1-3)LED	
	⚠	CP3001	ICP-N25	CIRCUIT PROTECTOR	
	⚠	CP4001	ICP-N15	CIRCUIT PROTECTOR	
	⚠	CP5301	ICP-N25	CIRCUIT PROTECTOR	

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AUDIO CONTROL HEAD BOARD ASSEMBLY <12>

PW1	LPA10010-01A1	A/C HEAD BOARD ASSY
CN1	QGF1208F1-07	FPC CONNECTOR

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LOADING MOTOR BOARD ASSEMBLY <55>

PW2	LPA10010-01A2	L.MOTOR BOARD ASSY
CN1	QGB2533K1-02	CONNECTOR

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LED BOARD ASSEMBLY <94>

PW2	LPA10008-01B2	LED BOARD ASSY
D7033	SLR-342VR3F	LE DIODE
HD1	PQM30038-1-2	LED HOLDER
CN7005	QGB2530J1-03	CONNECTOR,(1-3)MAIN